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ABSTRACT

Intended as a resource for incorporating computer assisted instruction into existing English curricula, this guide reviews current work with computers in grammar, writing, and literature. Divided into 10 sections, the guide first presents a statement of purpose and then provides an overview of the relationship between English and computers. Section three discusses the advantages and disadvantages of grammar and mechanics programs and evaluates programs developing basic writing skills. After section 4 reviews prewriting and word processing programs, section 5 discusses the use of CAI to develop critical thinking, journalistic writing, editing, and proofreading skills. Section 6 evaluates the claims and successes of poetry-generating programs, while section 7 describes the varied uses of computers in literary research, such as word processing, compiling bibliographies, and performing stylistic analyses. The guide concludes with suggestions for the English teacher's role in developing CAI programs in English. The guide also contains a glossary of computer terms and a list of human resources and printed materials on computers and English. (MM)

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RESEARCH MONOGRAPH SERIES
REPORT NO. 6

COMPUTERS IN THE ENGLISH CLASS

WITH PARTICULAR ATTENTION TO THE CITY UNIVERSITY OF NEW YORK

October 1983

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COMPUTERS IN THE ENGLISH CLASS
With Particular Attention to The City University of New York

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I. Preface

This report owes its origin to chance conversations last Spring with members of the Instructional Resource Center of The City University of New York.(36) Talk had been about basic skills in math and English, and when the word "interdisciplinary" came up, the word "computer" soon followed. Who was using or working on computer-assisted-instruction (CAI) at the various colleges? Was it any good? A few names were mentioned, but it was evident that while some names were familiar, each of us also had individuals in mind who were unfortunately unknown to the rest. And so the study was conceived as a kind of descriptive directory that would indicate who was doing what with computers in departments of English at the University. All kinds of English would be included: grammar and mechanics, critical and creative writing, including journalism, editing and proofreading, logic and critical thinking as these reflected intentions in English, and research--word searches in literature, for example, if these could be shown to bear on instruction. The emphasis would be on pedagogy, however, as opposed to computers used for administrative or clerical purposes, and therefore word-processing would be included to the extent that it was part of a writing curriculum.

Originally, the plan was to present a description for each college in the University, listing names and interests. The plan was abandoned when it became clear that no college had a formal program for using CAI, and that the amount of faculty involvement at each campus varied widely, both in the number of English teachers using computers, and in the level of faculty expertise. At some campuses, teachers have been working with computers for years, some developing their own programs or modifying existing materials. At other campuses, where no one in the department seems to be using CAI, there is, nonetheless, demonstrated interest, if this can be measured by newly-formed committees charged to look into CAI, by grant applications for hardware, usually for microcumputer (micros), and by statements of enthusiasm by department heads.

The plan, thus shifted, reflects interest and work in CAI not by CUNY college but by subject matter: grammar, writing, literature. It also includes descriptions and print-out examples of similar, and often more extensive, work going on across the country. The hope is that a topical arrangement will serve resource needs and suggest ways in which computers might be incorporated into existing curricula. Of course, no report undertaken to be completed in the space of a few months could claim to have covered the field; my procedure at CUNY was to begin with heads of departments and to catch, as catch can, names suggested and to interview as time and occasion would permit. My procedure outside CUNY was to write to those whose names most frequently and most prominently appeared in leading computer periodicals, as these were made known to me. I apologize in advance to those I have inadvertently overlooked. I did, however, impose one restriction which may seem arbitrary and unfortunate: I limited the report to departments of English, excluding related areas of ESL and reading. The decision was made because of constraints of time and organization. Different colleges in the university have different administrative and academic arrangements (some also have separate divisions of basic skills). I decided to concentrate on English as the discipline most responsible for teaching skills related to writing and literacy; as the

discipline most strongly insistent that such skills also constitute an art; and as the discipline most likely to oppose suggestions that computers be used in instruction. If traditionally-trained Ph.D.s in language and literature can be persuaded to interest themselves in computers, the field of CAI for English may finally get "quality control." It was mainly with such faculty in mind that I also decided to present this report in the form of an extended narrative, with topic chapters, rather than as a listing of various programs.

The overall arrangement reflects my sense of general interest in and general use of CAI: the way most English teachers are now looking at computers to "assist" them as instructors, which is the intent (and meaning) of "CAI." The assistance can be part of classroom activity and part of a course, or it can be outside work that students do on their own as much as possible. Software can be simple or complex, depending on what skills are included and what level is addressed. There are pre-packaged programs, made up by computer specialists hired by software companies, programs that allow teachers to add their own material, and programs designed by teachers on their own. What they all have in common is their presumption to instruct, to be a help, not a replacement.

There is little dispute that CAI can be used to help teach skills at the level of the sentence or provide reinforcement and review, despite the fact that most software is not good quality. Grammar and Mechanics is the area in which most college English teachers are demonstrating interest, and a critical interest. They are concluding, many of them, that the overwhelming number of grammar and mechanics programs on the market are not for them and that they can do better. But the evaluations have just begun.(12) With a growing number of faculty using computers for their own writing composing and editing ("word processing"), there is bound to be increased attention to computers as aids in courses in witing and literature. It is also expected that as more teachers become comfortable with the technology, they will move into controversial areas such as poetry, using computers not just to assist instruction, but to stimulate an interest in language and composition, particularly in students who appear unresponsive to traditional methods and means. Finally, if scholars become enthusiastic about computers, they might also come to use them for their own advanced research.

In any case, it is in the nature of a resource and critical review that this report is written, rather than as an endorsement. It is my firm belief that the medium should never be the message and that the best teaching, like the best literature, remains at heart a mystery.

Note

Because it was impossible to use many of the programs described here, for which PRINTOUT is given, critical comments should be judged accordingly. Authors are understandably loath to lend discs that may be damaged, copied, or misapplied, and many programs are, alas, not transferable. The only proper way to judge software is to use it and to observe others using it. PRINTOUT can only suggest content.

II. Computers and English: An Overview

"Garbage In, Garbage Out" is a well-known saying in the computer world--not as elegant as Coleridge might have put it-- "we receive but what we give"--but to the same point. English teachers may not appreciate the fact that a program is only a reflection of the programmer, but some of their caution about bringing computers into the classroom is based on their perception that most of what's out there is inadequate. They're right. Here's an industry leader, quoted recently in Money Magazine: "There are tons of software out there. Much of it is pathetic."(52) Programs don't work properly, don't do the stated job, and can't be understood from the accompanying manuals, most of which are poorly written and often unintelligible.

English teachers are understandably sensitive about software. They promote language, literature, and writing as parts of a discipline reflective of the ways of the critical and creative imagination--interests not generally amenable to the computer, and not quantifiable. What has the computer to say to them, and why should they even bother finding out if, admittedly, the field is filled with junk?

Answers are both practical and political. Despite the paucity of good software for college English, there are notable exceptions: programs already in use, being modified, and suitable for college-level instruction; programs that suggest ways computers can assist not replace the teacher; programs that, at the very least, can be regarded as pointing the way for those who would like to author their own. In other words, one reason for English teachers' taking an interest in computers is that there is some wheat, not just chaff, and it may be worth the harvesting.

Another reason, to paraphrase another familiar saying, is "because it's there." The computer as a means of receiving, storing, manipulating, and communicating information is not going to go away, and English teachers will be better off as informed critics rather than as ignorant antagonists fearing the machine invading the garden. What Stevens Institute of Technology and Drexel have begun, and Carnegie-Mellon University and Clarkson College of Technology are continuing--the requirement that everyone have a personal computer--the education industry will let no man or woman put asunder.(17) To beg the economic question--which colleges will be able to afford such a mandate, and the concomittant political question--what does it bode for society if some colleges have micros and others do not--the point is that unless English teachers learn a little about what their students will inevitably know, and their colleagues in other disciplines, they will not only jeopardize their role as leaders, they will have missed an opportunity to enhance those roles. Some computer-assisted instruction (CAI) in English is bound to free the teacher to devote time to the kind of instruction and assistance no computer can provide (despite what some researchers in CAI artificial intelligence may argue).

Though many in the computer industry many not know it yet, programmers and designers need English teachers. One of the main reasons there is garbage out there is that software has been developed mainly by those outside the classroom, outside English; simply--outside--by people who work in technology, not education, and whose constant interests are not writing or literature. If the only motive for some English teachers in learning

about CAI is to intone the Everlasting No, that may be motive enough. For if an organized and knowledgeable English faculty rejects CAI, cost-conscious administrators and "hackers" hustling hardware won't be able to put the cart before the horse anymore, at least not in English. The computer field is notorious for having developed so-called educational technology without first asking why or for what particular purposes. The brilliance of hardware design has far outstripped the ability of software to keep up.

But given all the fancy carts and horses hitched up belatedly, it behooves reasonable people to judge effects if carts and horses do seem to be important modes of transportation. Are there good programs out there or trends worth encouraging? The stake English teachers have in "computer literacy" can be enormous, despite the oddity of the term: "literacy," after all, means the ability to read and write, not do computations.

Although definition of "computer literacy" varies--does it mean appreciation of what the computer can and cannot do, or should it also mean some knowledge of programming?--no one need know BASIC, for example, to use a word-processor, or operate pre-packaged programs on grammar and logic. As the president of Carnegie-Mellon, Richard Cyert, points out, "Faculty members in the humanities have become avid users of computers," particularly in word-processing, and they rely on the university's computer system "more extensively than faculty members in Carnegie-Mellon's other colleges."

Nonetheless, in English, college faculty have lagged notably behind teachers in elementary and high schools in learning about software. There are, of course, good reasons for this discrepancy: most CAI on the market for English is designed for the lower levels and overwhelmingly addresses the kinds of skills commonly associated with grades K-12.(37) But the continued need for material designed for colleges with remedial programs, and the recent interest in software to assist instruction in composition from the "pre-writing" stage on through proofreading, has awakened college organizations, both local and national. Communication, Computing & Technology in Education is even a separate department at Teachers College, Columbia.(19) The Modern Language Association convention (December 1982) held two special sessions on computers, and last Fall (1982) the National Council of Teachers of English (NCTE) formed a Committee on Instructional Technology whose purpose is "to establish guidelines for the development of computer materials" for classroom use; "to define those content areas and process objectives within the English curriculum which best lend themselves to delivery;" and to "suggest new uses...and needed areas of research...."(55)

If informed teachers of English become reviewers of software, they may induce modesty in would-be programmers and prevent further glutting of the market. They may also encourage the education industry, in league with computer corporations, to be more selective in what they offer. In the highly-competitive field of software, where big money may be made and where there are not yet any standards, it is difficult to ask authors to exercise restraint or submit to peer criticism if there is no reason to do so. It is the rare author of CAI who will not say that his particular program is the right one and that others are not effective; or the rare

computer company that cannot afford to take a chance on an unknown, given the newness of the field and the chance of buying cheap.

Nonetheless, English teachers who see what they call poor programs agree that these are pedagogically unnecessary and/or intellectually unsound. English teachers sometimes like to think that data generation, with its attendant jargon, is a disease peculiar to those in other disciplines. Unfortunately, as much software shows, English teachers are as liable as anyone to confuse information with instruction, teaching with learning, and measurement with evaluation. A good deal of what has been developed for English is no better (and perhaps some of it is even worse) than the numerous workbooks that clog the market each year, each claiming to have found the key to better instruction. The poor program in English is merely an electronic workbook, correcting errors (while inadvertently making its own), straining to be "user friendly" and succeeding only in boring both students and teachers.

Good programs, on the other hand, have several features in common. They are usually complex in design, allowing for branching alternatives; truly interactive, allowing students to write meaningful responses that encourage thinking, brief in text, and graphically attractive. Such programs require expertise in programming and are usually designed by English teachers who know something about computers or who (also) work closely with those who do.

The time is ripe for English teachers to get involved if only as reviewers who can ensure that colleagues who do want to use CAI need not wade through reams of misleading promotional material. Critical interest may also remind new enthusiasts of just how difficult it is to turn out good programs. As Robert P. Taylor observes (The Computer in the School: Tutor, Tool, Tutee), "Teachers and other educators now entering this field may imagine they are breaking new ground when in fact they are not." Learning what's been done, he says, should encourage the English teacher to "build upon past accomplishments rather than blindly create them anew."(76) A knowledgable faculty is the best guarantee that quantity will not be confused with quality.

It is as potential users of CAI, however, not as prospective authors, that most English teachers will want to involve themselves with computers, and they will want to differentiate between programs of limited but practical value, such as those that provide drill and review, and programs that can truly be said to assist learning (in Britain, CAI is known as CAL, for "learning"). Carol E. Reed (Brooklyn College), prefers the term "computer-mediated" to suggest the active role that good programs encourage students to take(65) and her impatience with the term CAI, echoed nation-wide, is surely owing to well-deserved bad press. Still, the term is the general one, used to mean classroom-related use of computers, as opposed to uses for testing and record keeping. There is nothing intrinsically wrong with a program that "merely" reviews material in lock-step fashion, or is an electronic workbook (though it's debatable whether the means are worth the cost if print does the job just as effectively). The point to ask about such programs is whether they truly "assist" and thus free the teacher from laborious and repetitive tasks for more time for conferences and advanced instruction.

Helen Schwartz in the department of English at Oakland University (Michigan) has written persuasively of the potential of CAI for use and abuse(67), and her reminder that "computers cannot replace teachers," is worth reflection. Some teachers are extremely patient and unintimidating: computers always are, but their jobs are still limited. The more English teachers learn about computers, the more they will come to appreciate this fact. Kathleen Jaycox, a contributor to "The Illinois Series on Educational Application of Computers," puts the matter succinctly when she suggests that English teachers have concurred out of ignorance in their own stereotyping, as though the world of logic, symbolized by the machine, were a world apart from humanistic concerns.(37) Courses in the literature of science and in technical writing, however, may be helping to change attitudes. And so are retraining workshops and programs in computer science that are increasingly attracting faculty in the humanities. Jamesetta Holliman (Medgar Evers), for example, as a participant in CUNY's Faculty Development Program (1981-2), went from being Chair of the Humanities Division to teacher of data processing and computer programming(35), an experience that leads her to conclude that it is essential for English faculty to learn about "state-of-the-art computer applications" that include "concordances, vocabularly studies, syntactic analysis, stylistic analysis, textual criticism," and that an ideal way for English faculty to overcome "hesitancy and resistance" might be through word-processing. Word-processing may indeed help change attitudes, but teachers will still need to be convinced that CAI has pedagogical advantages over other methods and media and feel that it can engage their interests at levels beyond remediation.

Although the bulk of CAI in English has to do with assisting instruction at the level of the sentence, some exciting work is being done on the use of computers to help teach skills not easily taught--those that go under the heading of logic or critical thinking: the ability to generate main ideas, state them clearly, develop them coherently, express them with fluency appropriate to different purposes and levels of discourse. These are some of the stated goals of The City University's Writing Assessment Test and, with more stringent application, of proficiency exams at various senior colleges. Computer programs that try to address writing at non-remedial levels and writing in response to literature are important evidence that CAI can be more than a dull device for drill and review.

Not that drill and review programs should be denigrated out of hand, if they do the job. What CAI proponents say make computers more desirable than workbooks, even if CAI is only a workbook on a screen, are its immediate answers (FEEDBACK) and its ability to individualize response through alternatives in programs called BRANCHING. Supporters also cite self-pacing, privacy, dependability, and attractiveness of the medium as reasons to encourage use. CAI programs may not teach well, some advocates concede, but they do promote learning because they are more likely to be used than workbooks. Most programs will refuse to go on unless a correct answer is given, and such "brain-to-hand" activity, supporters say, guarantees that the work will be done. Willingly, they add: students are motivated by patient impartial programs, delighted with another form of T.V., aware of being in control as they guide a logical sequence of materials according to what they feel are their own needs and in response to what the program "tells" them about their progress.

Some CAI programs at the level of grammar and mechanics are adequate--it's not all garbage out there. And it's not all elementary. Some software designed for use in journalism and advanced composition is quite sophisticated, and text editors such as Bell Labs' Writers' Workbench series that correct inaccuracies and style may even seem downright scary in what they "know." Many teachers will feel uneasy with programs that report frequency of passive verbs, big words, compound-complex sentences and related information based on so-called readability formulas (itself a contested area), but it is important to remember that such software only advises: it does not demand assent.

On the other hand, there seems to be universal support for word-processing as a great advantage to both teacher and student, and English teachers who express extreme hostility to or fear of computers might well be introduced to this kind of software as a way, first, to improve their own efficiency in writing.

Learning about CAI in English, however, even finding programs that seem promising, is only part of a consideration to use computers. There are many would-be users who do nothing, for lack of support: financial, academic, administrative (political). Should CAI be a formal part of a curriculum? Where should terminals or micros be housed? How many hours a week should be spent with such materials, and how can they be effectively used with large class size? Will the introduction of CAI alter the crediting load of the faculty? What encouragement will be given to get faculty involved? Should separate divisions or colleges get together to apply for funding so that common concerns not be eclipsed by jealous rivalries and competition for limited resources? Such questions can only be hinted at, but they are significant in any determination to go even a limited way with CAI.

III. Computers and Grammar & Mechanics

Programs to diagnose, teach and test basic skills at the level of the sentence were the beginning of CAI in English, and they still constitute the greatest number of programs in the field: they are the easiest kinds of programs to write, being for the most part "drill-and-practice" (with record-keeping a side benefit for the teacher), and they are needed. No one disputes that computers can easily and efficiently take over a good deal of the tedium that marks instruction in grammar and composition. The problem is that most CAI software merely takes the tedium from the classroom and puts it up on a CRT.

Because there are so many drill and practice programs that don't engage the intellect or the imagination, CAI in general gets a bad name--a concept indicted by overwhelming evidence of inadequacy; a method suffering from too much, too soon and, ironically, in higher education, from too little. Too many English programs aimed at the post-secondary level are designed for primary use at lower grades or for the kind of all-purpose adaptation which never works. Teaching at grade is not the same as teaching remediation, for example. Adults, the fastest-growing population in higher education, need to be addressed in ways different from those tried with youngsters. Many English teachers at The City University know that college students, aged 18-21, going to school full time in an American heartland, don't require the kind of attention underprepared working students do, or burgeoning groups of minorities and ESL. USER FRIENDLY may be differently interpreted, depending on age and ethnic background. What's simple for one group may be simple-minded for another. Piaget's strategies may be fine for certain levels, but many teachers will question the transfer of heuristics originating in other disciplines and for different populations. It's not just "me-tooism" that motivates some college English teachers to want to write their own CAI programs.

Particularly with grammar and mechanics programs inadequacies show. Mindless drill is what they're often called, and for good reason: most are, especially those put out by companies whose software is compatible with the Apple, already in great numbers in schools and universities. Stressing memory and recognition of patterns requiring short-answer response, such programs seem to be no different from numerous workbooks that also tally right and wrong and provide prescription. Usually a student is given two tries to get the answer, but often, there were only two answers to choose from. When wrong answers are given, the program just says NO or TRY AGAIN, with explanatory text merely repeated. Drill, however, need not be mindless; pattern recognition can be a useful activity in instruction. But good CAI programs in grammar and mechanics require time to write and extreme care in sequencing. An electronic workbook can still be a good workbook.

Good CAI in grammar and mechanics instructs. Poor CAI merely tests and reports. Good CAI is related to classroom activity. Poor CAI kept "outside," an inexpensive and supplementary way to get by the teaching of remediation: Let class size increase: terminals and micros can do the job. In other words, under the advertisement that CAI allows students to work on their own, at their own pace, with instant FEEDBACK, grammar instruction can be short-circuited, made the secondary consideration that will

allow teachers to turn their main attention to Important Things. The attitude that "Computers can do the dirty work" suggests an unthinking division of labor between man and machine that is probably among the reasons software companies continue to deliver the same poor materials. Teachers who accept such programs don't really consider what CIA in grammar can do, can do better than teachers, can do as well as teachers but at lower cost, and cannot do. Needless to say, such attitudes reflect a failure to appreciate the difficulties of teaching grammar and mechanics effectively. It's not enough for grants to be won, hardware to be plugged in and then to behave as though the medium does not affect the message.

Poor CAI is the result of amateurism: of professionals who are teachers, educators and programmers failing to appreciate how CAI can be different from programmed learning texts (themselves often flawed and boring) and from classroom time; of not considering how CAI could be a device for changing student attitudes toward learning, of not reinforcing what has been taught, and of not encouraging teachers to develop an imaginative interest in computers. One of the more unfortunate surprises in the field has been the English software developed for higher education under the PLATO system, the most heavily financed such project in the country. Its inadequacies may constitute a formidable argument for home-grown products and for authoring. At the very least, such software should encourage English teachers to take a skeptical attitude toward promotional literature and software demonstrations and not be herded onto the CAI bandwagon, no matter how expensive it looks or how many riders are said to be on. But computer discs don't arrive in the mail like desk copies, so there is little opportunity to preview materials. Computer products cannot be remaindered at the bookstore. Rentals may be less expensive than outright buying, but they still involve a lot of money and time. It is therefore important for teachers to make previewing a condition of purchase and for deficient materials to be reviewed and publicized. Most of all, however, it is important that new computer programs be seen (not just read about) and preferably in groups, by students as well as by teachers.

PLATO

Under a Title III Grant, which took effect, Spring, 1983, York College has installed a PLATO terminal as part of its college-wide curriculum and faculty development program in CAI. (The Title III Grant also covers the purchase and use of micros.) The hardware is bought, the software rented from The University of Delaware. York thus joins the largest, most powerful computer-education software system in the country--but only tentatively. It is primarily as an evaluator that York is participating, with faculty from all disciplines reviewing programs in their fields.

PLATO, an acronym for Programmed Logic for Automated Teaching Operations, is an extensive and sophisticated "delivery" system, as it calls itself, developed in 1959 at The University of Illinois for primary use in the sciences. Today, PLATO covers many disciplines and is an extensive network linking users and authors nation-wide. The brainchild of the head of Control Data Corporation, a billion-dollar business that began with computers, PLATO, ironically, is the company's only money loser.(81) It is too expensive, educators say, and too restricted--PLATO software will

run only on PLATO hardware.(61) MICRO PLATO is also becoming available, but will run only on some machines. Critics fear that micros will mean loss of storage capacity and extra features which are the reported strengths of the existing system.

PLATO Delaware, a separate entity, sold to The University of Delaware by CDC, is the group most likely to sell or rent PLATO to universities. The cost of going through the University of Delaware, notes Che-Tsao Huang, Head of Educational Technology at York, is much lower than it would be going to CDC directly. Besides, the collection of programs owned by The University of Delaware (many of them developed at the University of Illinois) is academically oriented. CDC, on the other hand, is largely directed for use in business and industry. Nonetheless, adds Huang, should the consensus of his colleagues be against the software, York will terminate that part of the contract, pleased in any case that "it has made a substantial and needed contribution to the review of software material." Huang's remarks point up a major problem in the field: lack of objective and up-to-date evaluation.

The distinction between PLATO-CDC and PLATO Delaware may seem irrelevant, but noting the different sources of origin of PLATO programs is important: PLATO-Delaware, which publishes its own catalog of offerings--about 8000 instructional hours in 150 topic areas, is what most teachers will see. The distinction is important also because, in the judgment of York College faculty who have been viewing programs in English, PLATO-Delaware is not worth the investment.(88) It is a judgment peculiar to college English. In other academic areas, the responses have been quite different.

The Delaware Catalog of PLATO English and Language Arts consists of 130 programs (about 45 more have been added since the last catalog was printed, according to Louis Arena, Writing Director in charge of PLATO-Del.(61) The lessons run from ten-minute programs to those an hour and a half. There are six categories: grammar and sentence structure (the largest), punctuation, paragraph editing, words and word usage, vocabulary drill, footnotes and bibliography format and dictionary use. There is no fast and efficient way, however, to find out if English programs listed in CDD's Catalog are different from those put out by Delaware. A CDC General Education Division Curriculum section, said to be for higher education, contains many of the same programs listed in the Delaware Catalog while some CDC programs, not listed in the Delaware catalog, are by authors in the Delaware collection. There is also no fast and efficient way to find out about authors--what their credentials are, how their programs were evaluated before inclusion in the system, and what significance there is, if any, that so many of them come from small community colleges.

No software reviews reflect use, level, and student/faculty response. Although The University of Delaware will send an informal listing of "Suggested PLATO Lessons," no basis for judgment is given, and the suggestions, divided into remedial and college-level work, include only three for freshman English, two of them "games." Moreover, Delaware's conviction that "Sally Wallace has the best lessons for (remedial) students" was not supported by York College faculty who viewed her programs.

Although the PLATO system is more than just executable programs (being, among other things, an authoring system and a vast communications network), it is primarily as an instructional aid (CAI) that it should be judged. Is it significant that PLATO-Del. promotional literature and on-site demonstrations do not feature college-level English lessons? Unlike many programs in the sciences, speech, foreign languages, physical education, music, art, and language arts (for elementary levels), college-level PLATO English programs do not seem to exploit the capabilities of the medium.

Jerry Dalgish, for example (Supervisor of ESL at Baruch), worked on PLATO at The University of Illinois where he put up an elaborate series of lessons in Swahili, Massai, and other African languages.(23) He speaks of the advantages of computers to teach foreign language and also, as "efficient notebooks" to teach the attributes of the sentence, "morpheme by morpheme." But even if there were general agreement among viewers that some PLATO programs in basic skills were adequate, there would still be a question of cost-effectiveness: Is PLATO worth the expense? Che-Taso Huang, whose grant enabled him at least to sample the biggest and most widely used software package in the country, is waiting for faculty evaluations to come in, besides those in English. At that point, he will answer the question, according to how many disciplines other than English have received negative ratings.

Ironically, The University of Delaware itself admits that only "10% of its English materials are felt to be any good."(61) It is a judgment that is not the official line. The author of the 1982 "Sixth Summative Report of the Office of Computer-Based Instruction" at the University of Delaware speaks of "improved skills" as a result of using PLATO's English programs, but the sample PRINTOUT in the brochure, relating to grammar, may indicate why York faculty were unhappy with what they saw(34) -- apologetic introductions: "Everybody hates grammar. We all know how useless and pointless it is. So we try to avoid it with all our might" and elementary design: "child-appropriate graphics with adult content" Mike Southwell (York) sums up. Though designed for remedial work at the college level, PLATO-Del. authors would seem to be unaware of the growing number of adults, particularly working women, coming into higher education. But more than that, PLATO-Del. authors would seem to be unaware of some basic features of good instruction.

Carolyn Kirkpatrick (York, English) notes that the PLATO-Del. grammar programs are inconsistent, too simple and too sophisticated at the same time, and unimaginative, with too much text, and answers that say YES or NO but don't provide reasons. Joan Levinson (York, ESL) notes explanations that are "outdated, difficult to parse, and that reflect a view of language and writing that is superficial and unexciting." Frances Louis (York, English) comments on embarrassing USER FRIENDLY encouragement ("way to go" is a favorite). Some programs ask for names or nicknames, then never use them. All viewers noted errors in the programs themselves, which were obviously not proofread when they were accepted, nor re-reviewed since, and commented on a low-level of expectation: a spelling program, for example, asks the user whether "ellphints" looks wrong.

John Higgins (York, Teacher Preparation) looked not only at the grammar programs, but at the one lone literature-related listing--Chaucer's English and at a journalism program (Headlines). These two he found acceptable, all others dull, inappropriate and inadequate. Considering the level of remediation addressed, he points out that terms such as "etymology," "transitive verb," "diacritical" and "citation" need to be defined. He also notes samples disappearing from the screen in pattern modelling and a frustrating lock-step order which did not permit skipping, a failure to provide review at the beginning of a program, a seeming dependence upon previous or other programs where the sense of sequencing is not clear, and the substitution of testing for teaching. One program, for example, talks about subject/verb agreement but doesn't explain "person," a confusing concept for most remedial students. Another, listed as a Writing program, is only a review of the kind of reading comprehension (multiple choice) questions that appear on standardized exams. As Southwell says, "The big problem (with PLATO-Del.) is bad design, and it's fostered by an authoring system that makes it relatively easy to draw so-called cute figures and ask for answers without considering what or how or why to ask a question." Harry Brent, Writing Director at Baruch, sums up: "It's not for our students." Some programs in the system are too high-powered, most are too simple and flawed.(7)

Is poor PLATO-Del. CAI peculiar to English because English is the discipline least suited to a medium emphasizing visual design and algorithmic sequencing? Even if so, compared with other CAI materials on grammar and writing, PLATO-Del. programs suffer. Though some bear dates as late as 1979, they do not seem to have been written by English teachers who have thought deeply about the nature of composition or pedagogy.

It's not the first time that PLATO has evoked reservations. In 1975-9, the Educational Testing Service evaluated PLATO's use in five Illinois community colleges (a time before Delaware bought in). English was the only non-science subject in the package at the time. The evaluation found that "the PLATO system had no consistent impact on either attrition or achievement."(62)

Although PLATO-Del. literature in English indicates suitability for higher education and Delaware faculty list programs as pre-college (remedial) and regular freshman level, the programs seem designed only for high school or lower, and it is generally the case that wide application, while it may prove commercially attractive, has limited instructional value. An exception may be the large package developed for TIES (Total Information Educational Services), part of the Minnesota School Districts Data Processing Joint Board.(24) Called ELECTRIC ENGLISH, its main programmer, Dan Daniel, describes it as a "complete authoring system" in the areas of grammar, usage, and punctuation for 48K Apple IIs. Although Daniel indicates that the target audience is remedial high school students, he adds that because ELECTRIC ENGLISH is an authoring system, lessons can be redesigned "to fit a more sophisticated audience."

Authoring programs will probably appeal to teachers with confidence in themselves as teachers. There's no denying the pleasure in writing one's own lessons, but caution should prevail. In the past, says Robert Caldwell in "Guidelines for Developing Basic Skills Instructional Materials

for Use with Microcomputer Technology," authoring programs have suffered from too much tell and not enough show. (11)

The following PRINTOUT from Rudy Spraycar's CALAIS (Computer-Assisted Language Arts Instructional System), developed specifically to "improve undergraduate instruction in composition," illustrates how authoring programs work.

```
LESSON STRUCTURE 1:
     A: EXPLANATION OF RULES (OPTIONAL)
     B: EXPLANATION OF HOW TO ANSWER QUESTIONS OR EXAMPLES
     C: SERIES OF QUESTIONS OR EXAMPLES (ANY NUMBER)
     NOTE:  THE SERIES B+C ABOVE CAN BE REPEATED ANY
     NUMBER OF TIMES YOU WISH:  THAT IS, YOU CAN ASK
     AS MANY QUESTIONS (OR PROVIDE AS MANY SENTENCES
     TO BE CORRECTED) AS YOU LIKE.  WHENEVER NECESSARY,
     YOU CAN PROVIDE A NEW EXPLANATION TO BEGIN A NEW
     "UNIT" OF QUESTIONS.
LESSON STRUCTURE 2:
     A: EXPLANATION OF RULES (OPTIONAL)
     B: INSTRUCTIONS FOR ANSWERING
     C: EXAMPLE
     D: FIRST QUESTION ABOUT EXAMPLE ETC.
     NOTE:  THE SERIES B+C+D+E. . . CAN BE REPEATED AD
     INFINITUM: THAT IS, YOU CAN OFFER THE STUDENT AS
     MANY EXAMPLES AS YOU LIKE, EACH FOLLOWED BY AS
     MANY QUESTIONS AS YOU WISH TO ASK ABOUT EACH ONE.
WHICH LESSON STRUCTURE DO YOU WISH TO CHOOSE (1/2)?

     ************************************************************
     ***** IN ANSWER TO THIS AND TO ALL FOLLOWING QUERIES, ******
     ***** YOU MAY TYPE IN A SUCCESSION OF LINES, INDENTING *****
     ***** SUBSEQUENT ENTRIES AS YOU PLEASE.  HIT THE       *****
     ***** CARRIAGE RETURN A SECOND TIME AFTER TYPING IN    *****
     ***** THE LAST LINE IN ANSWER TO A GIVEN QUESTION IN   *****
     ***** ORDER TO GET ON TO THE NEXT ITEM.                *****
     ************************************************************
     ***** EACH UNIT BEGINS WITH GENERAL EXPLANATORY        *****
     ***** MATERIAL.  THIS MAY INCLUDE BOTH REVIEW OF       *****
     ***** MATERIAL STUDIED AND INSTRUCTIONS FOR COMPLETING******
     ***** THE EXERCISES, INCLUDING SAMPLES WITH ANSWERS    *****
     ***** IF YOU WISH.                                     *****
     ************************************************************
WHAT IS THE NAME OF UNIT 1 OF LESSON 1 (NO MORE THAN ONE LINE)?

splices I

DO YOU WISH TO PROVIDE A REVIEW OF GRAMMATICAL OR OTHER RULES AT THE BE-
GINNING OF UNIT 1 OF THIS LESSON (YES/NO)?

?
```

THE REVIEW OF RULES, ETC., IS OPTIONAL. DO YOU WISH TO PROVIDE A REVIEW OF GRAMMATICAL OR OTHER RULES AT THE BEGINNING OF UNIT 1 OF THIS LESSON (YES/NO)?

yes

WHAT IS THE GENERAL REVIEW OF RULES, ETC., WITH WHICH YOU WISH UNIT 1 TO BEGIN?

Whenever two independent clauses are joined together in a single sentence, a comma alone is not sufficient to connect them; clauses incorrectly connected in this way create a run-on sentence or a comma splice. Such clauses should be joined by a semicolon or connected by a comma plus a coordinating conjunction, such as "and" or "but." One could also make each clause into a sentence by itself.

WHAT ARE THE INSTRUCTIONS (AND SAMPLES WITH ANSWERS, IF YOU WISH) THAT YOU WISH TO OFFER FOR UNIT 1?

Read each of the following pairs of independent clauses and decide whether each is correct or is a run-on sentence. If the sentence is correct, then type in the word correct; otherwise correct the sentence by rewriting it with a semicolon, as two separate sentences, or with a comma plus a coordinate conjunction.

TYPE IN QUESTION OR EXAMPLE NUMBER 1:

This is a sample sentence, it is not very interesting.

WHAT IS A/THE CORRECT ANSWER TO QUESTION 1, JOHNNY?

This is a sample sentence; it is not very interesting.

WHAT DO YOU WISH THE TERMINAL TO SAY IN RESPONSE TO THIS ANSWER?

Very good; you also could have corrected this sentence to read:
This is a sample sentence. It is not very interesting.
This is a sample sentence, and it is not very interesting.

IS THERE ANOTHER POSSIBLE CORRECT ANSWER THAT YOU CAN ANTICIPATE (YES/NO)?

yes

WHAT IS A/THE CORRECT ANSWER TO QUESTION 1, JOHNNY?
This is a sample sentence. It is not very interesting.

WHAT DO YOU WISH THE TERMINAL TO SAY IN RESPONSE TO THIS ANSWER?

Fine; you also could have corrected this sentence to read:
This is a sample sentence; it is not very interesting.
This is a sample sentence, and it is not very interesting.

IS THERE ANOTHER POSSIBLE CORRECT ANSWER THAT YOU CAN ANTICIPATE (YES/NO)?

yes

WHAT IS A/THE CORRECT ANSWER TO QUESTION 1, JOHNNY?
This is a sample sentence, and it is not very interesting.

WHAT DO YOU WISH THE TERMINAL TO SAY IN RESPONSE TO THIS ANSWER?

This is ok, though it is a rather loose sentence; you would be
better off saying either of the following:
    This is a sample sentence; it is not very interesting.
    This is a sample sentence. It is not very interesting.

IS THERE ANOTHER POSSIBLE CORRECT ANSWER THAT YOU CAN ANTICIPATE
(YES/NO)?

no

WHAT IS A/THE INCORRECT ANSWER TO QUESTION 1, JOHNNY?
This is a sample sentence, it not very interesting.

WHAT DO YOU WISH THE TERMINAL TO SAY IN RESPONSE TO THIS ANSWER?

You have made no changes in a sentence that included a comma splice.
You should have corrected the sentence in one of the following ways:
    This is a sample sentence; it not very interesting.
    This is a sample sentence. It is not very interesting.
    This is a sample sentence, and it is not very interesting.

IS THERE ANOTHER POSSIBLE INCORRECT ANSWER THAT YOU CAN ANTICIPATE
(YES/NO)?

yes

* * *

IS THERE ANOTHER POSSIBLE CORRECT ANSWER THAT YOU CAN ANTICIPATE
(YES/NO)?

I'm not sure.

I CAN ONLY READ YES OR NO;
IS THERE ANOTHER POSSIBLE CORRECT ANSWER THAT YOU CAN ANTICIPATE
(YES/NO)?

no

DO YOU HAVE MORE QUESTIONS/EXAMPLES TO ADD TO THIS UNIT (YES/NO)?

yes

TYPE IN QUESTION OR EXAMPLE NUMBER 2:

this point has been made, this example will be shorter.

The program, originally designed for PL/I-based command language to be run on IBM systems, is being translated into BASIC for Micros.

Although authoring programs in basic skills might challenge English teachers to do better than what they see on the market, those new to computers should be aware of dangers. It is one thing for an "interactive" medium to call up extended student response; it is quite another in an authoring program for a teacher to be as loquacious. In Spraycar's sample, admittedly slanted to long replies in order to demonstrate the range of the system, I counted 67 words for review, 53 for instruction--quite a lot of text for students to digest on a CRT--or anywhere at one time. The program is easier to use in the short-answer mode, Spraycar says, and, one might add, it is then closer to the spirit of CAI. Of course, authoring systems can suffer from the same cuteness or pompousness found in packaged programs, and from other troubles, but English teachers helping to create their own programs may welcome the responsibility of defending or revising them. Authoring programs can provide a unique opportunity not only for students but for teachers to learn about their own teaching style. Hard-copy response from several faculty who have authored their own grammar programs--on the passive voice, for example--might make for a provocative workshop. At The City University, considered a leader in the teaching of grammar and composition since the advent of open admissions, such faculty exchanges are common, particularly in regard to reader-training sessions held periodically for grading the CUNY Writing Assessment Test. Using computers to help improve the teaching of basic skills is therefore a natural and timely direction for English departments at CUNY or anywhere to take.

LaGuardia Community College, for example, has a Vocational Educational State Grant to buy micros that will be used exclusively to help address "writing-related learning disabilities."(45) Another grant will cover the teaching of typing skills, and both, according to English department chairman Daniel Lynch, reflect the college's emphasis on "collaborative learning," a basic skills program that has won national recognition. Most micros will be for students, with some reserved for faculty to use for curriculum development and word processing. Significantly, the grant had a cooperative origin: a data processing faculty member came to Lynch to talk about working together. Sometimes, as in the case of Kingsborough Community College, the impetus is the administration which urged the formation of a college-wide committee at KCC to devise grant proposals for CAI. It is significant, reports Steve Weidenborner(83), that KCC's committee is college wide and contains a member of the English department, an inclusion that would have been unheard of five years ago. Indeed, at York, where a Title III grant was awarded for development of college-wide CAI five members of an English department of seventeen, all traditionally-trained Ph.Ds., will be involved in developing courseware.

Unfortunately, interest in CAI is useless unless there's money to follow. The plight of an English department is typical: perceived need, less funding at state and federal levels, and competition for access with data processing and science departments. Even more unfortunate is the

fact that so many colleges with similar needs are applying for the same limited government grants.

It is ironic that just as English departments are awakening to the benefits of CAI, funding sources are shrinking and competition is increasing with science departments, the traditional users, who need to replace faulty and outdated equipment. An alternative might be that what individual colleges can no longer get, their university might get for them, with a basic skills task force composed of representative faculty interested in writing across the curriculum.

Marie Jean Lederman, University Dean for Academic Affairs and Director of the Instructional Resource Center, takes the tack better late than never, reflecting a commitment to explore what's "out there" (43) and then to examine the politics of a united bid for funding. What's amazing, however, is how little faculty in one college knows about what's going on in another. Some egos might be damaged but most English teachers should want to know what others are doing and save time to benefit from peer criticism.

It's been six years that Ira Bloomgarden and Ken Morris at John Jay College of Criminal Justice (6) have been using computers to help teach subject-verb agreement, sentence structure, and verb forms. That information, however, is not widely known within The City University. Technically, CMI (Computer-Managed Instruction), what Bloomgarden and Morris use, not CAI, involves computers to inform students about errors and to provide weekly prescriptions for remedying them. It is a reporting system, not an instructional one, but it is related to instruction. Low-cost, easy-to-use, CMI at John Jay is a diagnostic that integrates testing and analysis for purposes of devising student review. Called TIPS, (developed at Duke University) and the system will turn an instructor into "something of a programmer" they say, a practical way for a novice to become computer literate and experience the "joy when a program runs successfully."

At Hostos, Norma Lawrence (English), "course manager" for Basic Writing, has been working with computer science faculty on an interdisciplinary volunteer project to teach basic writing.(42) And other units are busy on grant proposals for micros related to instruction for remedial and freshman English.

As these activities illustrate, many CUNY faculty in English have been quietly working on their own for years, like B.J. Rahn at Hunter sitting in her office ready to explain with a terminal, privately bought, she probably does more, informally, for the cause of CAI than many courses do.(64) Then there is Mike Southwell at York who has been working for several years to perfect grammar programs. Computer literacy committees have also been formed at many colleges, but political action takes time, and changes in budget and curricula delay implementation.

For some CAI projects that have been abandoned or not renewed, there is also interest in explaining why, for purposes of possible renewal. Looking back at Brooklyn's five-year "computer-mediated classroom" (1968-1973), Carol Reed remains a strong supporter of computers for get-

ting at "the more tedious kinds of drill and practice exercises" which burden both teachers and students, such as "pattern-recognition skills" which form a significant part of instruction in grammar and syntax.(65) But she also sees that there were problems wrought by the introduction of CAI, such as confusion of roles, for some faculty. Reed was project manager at the time, and the CAI courses used were developed by the Language Learning Group, a research division of IBM, in conjunction with faculty from SUNY and CUNY.

Clearly, there is more involved in using CAI than sifting out good materials. It is likely for example that many teachers pursuing CAI on their own, without funding, will go unsung since the leading periodicals in college composition only occasionally publish articles on CAI. And for many who may be interested in publishing on computers some hard questions remain: what constitutes research and scholarship? Will writing a program in CAI count as "publication"? A recent article in College English by Joseph Bourque takes up these questions and concludes that the CAI specialist in English requires training and preparation greater than what is required within the discipline, and that evaluation is possible if guidelines are adhered to which demonstrate that computer programs in English can be run without bugs, are used widely and enthusiastically by students, are efficient, inexpensive, and friendly and come accompanied by sound and readable documentation.(8) One of the main points made by Bourque is that good programs take a great amount of time to design from a logical and pedogogical point of view; to develop, including debugging and refining; and to test. Careful authors publish preliminary drafts and are forever tinkering.

Southwell (York) has been writing and revising CAI lessons in basic skills that form a substantial part of the basic writing curriculum at York. The lessons, computer versions of print exercises in grammar and syntax developed by Southwell and colleagues Mary Epes and Carolyn Kirkpatrick (published as The COMP-LAB Exercises), use ESL techniques "to help students use correct word forms not in isolation, but in the context of sentences and even paragraphs." Originally designed for CUNY's timesharing system, two of the lessons, noun plurals and verb agreement, have been for the last two years part of a micro-based remediation course at York.

Southwell is now developing a full set for the Atari which, he says, "offers the best possibilities (on micros) for the kind of graphics, color, and sound enhancement that is essential to make the lessons maximally effective." Significantly, the first lesson in the CAI modules is how to use the computer and the keyboard, and plans are under way to incorporate typing instruction and word processing.

Aware that CAI text should be short and simple, Southwell restricts information to one topic at a time and to what will look neat on the screen. Some frames give examples or explanations; other review. Parallelism predominates:

Now it's time to learn about VERB AGREEMENT.

Verbs in the present tense
    must have different forms
if their subjects are different in number.

When the subject of a sentence is SINGULAR,
    the verb has one form,

but when the subject is PLURAL,
    the verb has a different form.

(Notice that "different" means different in NUMBER:
singular or plural.
(Press RETURN to go on.)

Still, the question remains: how is the computer-assisted autotutorial instruction better than that of the conventional workbook?

Certainly the idea of "individualizing" instruction might be addressed by a well-designed workbook, and an efficient marking system might also provide immediate FEEDBACK. It might even be said that a good workbook is more valuable since it's never "down" or dependent on the presence of lab supervisors and that it's more likely to be used for review since it's portable. Southwell's response: "No print materials could ever give students the experience of switching back and forth between singular and plural subjects to see the effect of the verb, for example. A student comes to understand how the form of the verb is affected by the number of its subject by actually watching them change."

Other answers are obvious from observing students at a keyboard but these answers have more to do with attitude than with improving performance. If a terminal or micro is set in comfortable surroundings (a consideration sometimes ignored by those who talk about "atmospheres for learning"), students will stay with the program longer than they will at a workbook, and because most programs are lock-step procedures, students will have to do everything asked of them in order to go on. Then there is the psychological advantage, supporters say, the sense of power and responsibility that comes when "the student controls the process."(18) Thus, students will be motivated to spend more time with instruction, and the computer, which can "branch" automatically depending on need, will serve up extra examples and exercises.

It's not known how many composition teachers tell their students why they're using a certain text or workbook, what its advantages are (and limitations), why the "Preface to the Student" is there-- or how a grammar book (or a math text) should be read (s-l-o-w-l-y). The point is: telling students how to "read" (regard) a certain program is important, and the teacher not a lab assistant ought to be around for the first "hands-on" experience.

There should be lessons, from time to time, that students could do together in small groups, such as editing. A program developed at Denison University (9) "will take a (student) essay already in a file in the computer and set it up to facilitate its use for class discussion" by "separat(ing) the essay into sentences, number(ing) the sentences, and

leav(ing) space for student comments after each sentence." Paragraphs can also be identified. It's the kind of "student publication" that English teachers know elicits lively class response and that's particularly well-suited to a computer.

Good CAI in grammar requires careful design and integration into a syllabus. Just as data sequencing and immediate feedback do not by themselves guarantee effective use of drill and practice programs, so even more complex and "individualized" CAI tutorials require considerations other than content. It seems safe to say, however, that tutorials, with their many "branchings" in response to whether students answer correctly or not, are probably preferable to the drill and practice programs which so often become merely a guessing game for the student and a boring waste for the teacher after one run.

Good tutorials should "branch" at appropriate times, providing needed explanation, background review and additional examples. The problem is, such supplementary instruction requires enormous amounts of material to be stored. Such programs take a long time to write and probably require collaboration between English faculty and experts in computer science.

Will colleges provide money or time? What if grants are not available? Is the experience of a few who have gone off on their own to math and computer science departments to take courses, to Radio Shack for special seminars, to their own cellars with privately-bought terminals or micros--is this experience transferable to others in the English department? Are some faculty too "settled in their ways" to learn?

The answers are probably more in the software than in the mode. English teachers will try CAI in grammar if they see something worthwhile, and it is up to those who are using good materials or developing them to show others. If teachers see in computers some personal benefit they will inevitably become more tolerant of experiments in CAI. The basic skills field, however, is still much too crowded with junk to attract senior faculty who draw distinctions between teaching composition, and literature and literary research. It may be that other levels, for them, will prove more persuasive.

IV. COMPUTERS AND WRITING

PRE-WRITING

"Pre-writing" is the word adopted by many composition specialists to describe the kind of thinking (sometimes called "brainstorming") that goes on as an idea takes shape and that is recorded on scrap paper, in journals, and now on CRTs. Such thinking goes on all the time, of course, as experienced writers know, sometimes into late drafts where substantial shifts are made in content or point of view, but as a stage in what's referred to as "the composing process," suggestive as it is of discrete sequences and ordered deliberation, "pre-writing" is used to stand for the often messy, random casting about for something to say that precedes writing. It's what "happens" before controlled writing begins and main ideas or topic sentences get delineated. Computers are now said to aid pre-writing by helping to generate significant and sufficient content by eliciting relevant and specific details in response to programmed questions. Such programs are called rhetorics or dialogues because they have to do with stimulating invention and because some of them work off classical models, using Aristotle's topoi, for example.

The granddaddy of such CAI is Major Hugh Burns, from the U.S. Air Force Academy in Colorado.(10) Someday someone will no doubt explain why some of the most imaginative and substantial work in English originates on the other side of the two-cultures bridge--one recalls Professor Tom Sawyer's interdisciplinary work in writing at the College of Engineering at the University of Michigan. (Burns, by the way, is no longer developing such programs.) Burns' work began in 1977 as a research project to design, program, test, and evaluate CAI modules for stimulating rhetorical invention in freshman composition. As he says, his task was to design a sequence of answerable, interesting and appropriate questions that would cause further questions to be asked and to make students aware of what they knew and didn't know about the subject being explored, a subject indicated by the student in two or three words--as "fear of death" in the PRINTOUT that follows.

In Burns' programs, students encounter the kinds of questions English teachers typically ask in order to encourage students to back up opinions, provide sufficient detail for persuasive argument, and keep answers in a coherent context. Unlike the questions English teachers typically ask, Burns' program also gives students a chance to revise their answers, reconsider the quantity and quality of response, and constantly confront the fact that their output will be used for writing. The emphasis on continuity is one of the major advantages of the program, over classroom discussion, and the fact that it is up on a CRT, with frames dependent on each other and on response in order to move ahead, is one of the advantages of the computer over the workbook: students cannot skip parts and, having answered, can go back to revise. They answer, knowing there will be immediate "FEEDBACK" from the program, and this sense of immediate response, when information will be needed to write a paper, is what may motivate students to use the program, particularly those for whom it was designed--whose average SAT scores on the verbal are in the 440s.

DURING THIS EXPLORATION PROCESS,
YOU WILL BE ASKED TO CLARIFY THE

PURPOSE OF YOUR PAPER ON FEAR OF DEATH.

SO NOW WOULD YOU BRIEFLY DESCRIBE THE PURPOSE OF YOUR PAPER BY COMPLETING THIS STATEMENT: THE PURPOSE OF THIS PAPER IS TO. . .

EXAMINE THE FEAR OF DEATH PEOPLE HAVE, WHERE WE GET THOSE FEARS, AND HOW WE MAY REDUCE THOSE FEARS.

FINE, WALT, YOU AND I WILL TALK AGAIN ABOUT YOUR PURPOSE.

RELAX NOW, WALT, AND ENJOY THIS BRAINSTORMING SESSION.

WHAT OBJECTS DO YOU ASSOCIATE WITH FEAR OF DEATH? HOW MIGHT THEY BE INCLUDED IN YOUR THEME?

FEAR OF THE UNKNOWN, CESSATION OF LIFE, FEAR OF CAUSING PAIN TO OUR LOVED ONES.

THAT'S THE IDEA, WALT. GIVE ME SOME MORE INFO NOW.

PAIN IS ANOTHER FEAR CAUSER, KNOWING WE HAVE TO DIE DOES NOT RELIEVE THE PAIN/FEAR OF DYING

SUPER, WALT.

ANYTHING ELSE?
(YOU CAN ADD MORE INFO, ASK A QUESTION, OR GIVE A COMMAND-WHATEVER YOU WISH.)

HOW DOES EUTHANASIA, MERCY KILLING, SUICIDE, MURDER, AND ACCIDENTAL DEATH ADD TO OUR FEARS?

I COULD SAY THAT THAT'S FOR ME TO KNOW AND FOR YOU TO FIND OUT.

SERIOUSLY, I CANNOT PRETEND TO KNOW 'HOW,' BUT YOU SHOULD KEEP EXPLORING FOR AN ANSWER.

CONTINUE!

(TRY EXPLAINING A LITTLE MORE, LESS PHRASES, MORE SENTENCES.)

WE'RE MOVING RIGHT ALONG. HERE IS QUESTION 2.

WHAT COULD BE CONSIDERED A RESULT OF FEAR OF DEATH?

NERVOUSNESS, DEPRESSION, SUCIDAL TENDENCIES.

BY GEORGE, WALT, GOOD ONE. WRITE A LITTLE MORE, PLEASE

HATRED FOR THE PERSON WHO CAUSED THE DEATH, OR THE PERSON WHO DIED

FANTASTIC, WALT. ANYTHING ELSE?

CONTINUE!

OKAY.

DO YOU WISH TO NARROW OR CHANGE YOUR SUBJECT? (MAYBE REVISE THE WAY IT SOUNDS IN THESE QUESTIONS?) (YES OR NO?)

NO

(IF YOU NEED MORE ROOM, TYPE '&&' AT THE END OF A LINE.)

HERE IS QUESTION 3, WALT.

WHAT HAS BEEN DECIDED ABOUT FEAR OF DEATH TO DATE?

EXPLAIN.

DECISIONS HAVE BEEN MADE ABOUT FEAR OF DEATH. WHAT WERE THEY ABOUT? WHO MADE THEM?

FOR EXAMPLE, IF I WERE WRITING A PAPER ABOUT INFLATION. I WOULD WANT TO WRITE A PARAGRAPH OR TWO ABOUT THE GOVERNMENT'S LEGISLATION TO DATE.

TRY ANSWERING THIS QUESTION NOW.

CALIFORNIA HAS A NATURAL DEATH ACT WHICH ALLOWS PEOPLE TO DECIDE IF THEY ARE TO BE TAKEN OFF A LIFE &&

GO ON, WALT.

SUPPORTING MACHINE

GOOD, WALT. ADD TO YOUR RESPONSE NOW.

PEOPLE HAVE HAD VARIOUS ORGANS TRANSPLANTED INTO THEM TO PROLONG THEIR LIFE.

OUTSTANDING, WALT.

As the Burns PRINTOUT shows, the "process of thinking" involves refining a term or phrase. There is no next question which moves off a right or wrong answer because the program is an example of what Burns calls "non-data conditioned response," in the nature of problem solving; an "open" program, attached to no specific body of content. Burns' findings indicate that the program helped students "articulate, refine, and preserve their ideas" and although he concedes "limited semantic understanding"--he does think that the programs "emulate the verbal behavior of intelligent, personal, inquisitive human tutors." Critics might point out that it was such form-determined rhetorics that, in the opinion of philosophers such as Alfred North Whitehead, caused education to lose contact with the real world. On another level, critics might also indicate the tendency of such programs to degenerate into parody. All-purpose questions, it may be said, will generate predictable, mechanical response. If Burns is aware of such concerns, he does not answer them, but rather points to specific gains: a greater number of ideas generated (over control group response); "insightfulness and factuality of the ideas"; and higher quality of inquiry, with many answers appearing verbatim in the actual writing that followed. Not least, he adds, is information yielded about composition research. From such programs, English teachers may concentrate not just on what they teach, but also on how. They can also generate discussion about the extent to which quantity affects quality.

But what if students just fool around, skeptics say, type in idiotic, even obscene answers and abuse the program? What control is there that such games will not occur? The answer is, of course, there is none. The program will "accept" any kind of answer, even a right answer full of misspellings (unless a Spelling Checker is included). An argument might be made, however, that allowing the more fearful or recalcitrant to have fun may be an ideal way to encourage serious response the next time through--and with computer programs, there can always be a next time--even midway through the fun-and-games. At a recent meeting of the New York City Association of Teachers of English (NYCATE), for example, where a dialogue program such as Burns' was demonstrated, and where questions were asked about the character of Lady Macbeth, the Chairman of a prestigious high school English Department insisted that an answer include "Lady M's sending out for pizza." The challenge, then, of extending that observation, detailing it and linking it to other characteristics and to a theme soon brought the Chairman around--not to abandoning his sense of humor but to thinking seriously about the intent of the questions.

Dialogue programs that are friendly, show no strain, and properly introduce themselves are likely not to be abused. Ellen Nold's "heuristic", for example, written when she was at Stanford, is USER FRIENDLY, and manages to keep an informal tone as it advances from simple to complex in a lesson on logical fallacies.

```
- Hi there.  What's your name?
Susan Bartholemew
- This program, Susan Bartholemew, is about
fallacies of relevance.  Do you know what
a fallacy is?
not really certain
- Logicians define the word fallacy as an
error in reasoning or in an argument.  A
conclusion that does not follow from its
premises is called a non sequitur (Latin
for "it does not follow").  All fallacies
are non sequiturs.
- Here are the names of four kinds of fallacies:
  1.  Appeal to pity
  2.  Bandwagon
  3.  Argument against the man
  4.  Argument by force
Now here's an argument:
"Don't convict me, Judge. Sure, I stole
the money, but if I go to jail, my wife
and six kids will starve."
- Which kind of fallacy is this?
appeal to pity
- Right
- What about this argument: "Listen,
John, It's pretty unwise not to vote
for the Labor Party.  There have been
some. . .uh. . .nasty incidents."
- Which fallacy is this?
force
- Right again, Susan Bartholemew
- Now you write a bandwagon argument.
I'll start it. "Mom, I've just got to
see The Exorcist because. . ."
all my friends are going
- I was thinking about that answer too.
- What's an argument against the man?
One where you argue against a personality.
- O.K.  Here's an example.  "You can't
believe anything Senator Snort says.
He's not a good Catholic and he tells
dirty jokes."
```

In her article, "Fear & Trembling: The Humanist Approach to the Computer" (57), Nold stresses the tolerance and patience of such CAI dialogues along with their ability to evoke meaningful responses which students then use in their essays. Perhaps one of the more meaningful testimonies that such programs can work is that which follows the PRINTOUT of a program Nold says is written in the "probe and modify" mode, one that Stanford

students indicated was "the most useful" in the "actual process of writing."

- Hi. What shall I call you today?
Confused.
- Confused, this program is for people who are preparing to write persuasive or argumentative papers for a course or for a particular audience. Do you have specific material to work on right now?
Yup.
- O.K. Use two or three words to state the subject of your paper.
Teaching with computers.
- What is the main point you will make about teaching with computers?
You have two lines.
That there is no reason humanists should not use this technology to further their own goals.
- Who is your audience? Who are you trying to persuade or convince?
Teachers.
- What do teachers already know about teaching with computers? Again you have two lines.
That computers can be used for instruction, but mostly in drill and practice mode.
- Is there any new information or idea you will have to explain before making your point about teaching with computers?
Yes.
- What is the new information? Again, you have two lines.
That other teaching styles are possible; that creativity is possible; that computors are easy to program.
- What are the teachers' attitudes about teaching with computers"
Apathy and fear.
- Will this affect the teachers' receptivity to your arguments?
You bet.
- You said that you were going to argue the point that there is no reason humanists should not use this technology to further their own goals.
Given their attitude, they'd probably deny it, don't you think?
- Then you will have a more difficult time. What points will you make in support of your main argument? Number them for your reference. You have five lines.

The program called "Arrowroot" goes on to encourage further detail, possible objections, restatement, and then it suggests organization.

What is particularly interesting about Nold's claims is the fact that she used this very program to generate ideas for her essay about it--persuasive endorsement. But couldn't a text do the same thing? Ask the same questions and leave room for appropriate answers? Of course. But CAI enthusiasts will point out that programs such as Nold's and Burns' are "interactive", prevent skipping, and create the illusion of a dialogue--all significant for learning. As "Star Wars" and "2001" have demonstrated, human beings tend to forget computers or robots are machines and a now-famous MIT experiment, a woman in one room, a computer and a psychiatrist in another, illustrated that the woman was unable to tell from response which one she was talking to. Angry students have also been known to talk dirty to computers--and hit them.

Despite the ironic remark in the next PRINTOUT -- "I'm just a computer and so don't know" -- it's obvious from the USER-FRIENDLY tone that the "human touch" can go a long way. The program is by William Wresch, at the University of Wisconsin (86) Center (Marinette) and it shows the ease with which "answers" can constitute an essay. Artificial? No doubt, but what about the "formal outline" which most students confess they construct only after the fact and which most teachers never use anyway?

```
Welcome to Essay Writer

The purpose of this program is to show
you some of the information needed to
write an essay, and to show you how
that information can be structured.

This program will ask you a series of
questions.  Just answer them and the
computer will do the rest.

First, pick a subject you would like
to write about.  (Just type in the name
of your subject and then hit return)

?Trees

That sounds like a good topic, but maybe
you could come up with an even better
subject if you got more specific.  For
example, if you were writing about a house,
a more interesting subject might be a
specific room like a kitchen or your room.
What do you think?  I'm just a computer
and so don't know.  Do you think you
could make your subject more specific?
Why not reenter your subject and then hit
the return key again?

?Birch Trees

Good.  Now let's take a closer look at
Birch Trees.  To begin with, which of
```

the following areas would tell me the
most about Birch Trees

1 . . . History
2 . . . Appearance
3 . . . Causes
4 . . . Job or function

Type in the number of the approach that
would tell me the most about your subject,
and then hit return
? 4 . . .

Let's try a descriptive essay.
To begin with input the number of the
three most important statements below.
(Remember to hit return after each number.)

1 . . . They make good Canoes
2 . . . They can be made into fences
3 . . . They make good firewood
4 . . . The bark can be stripped to make a kind of paper.
5 . . . NO
6 . . . NO

? 2
? 3
? 1

Okay. Let's start with the first major
job or function of Birch Trees. You said
it was they can be made into fences.

I'm going to give you space for six
descriptive sentences. I'd like you
to type in as many sentences as you can,
describing this job or function of Birch
Trees . . .

* * *

The resulting essay then follows:

BIRCH TREES

If you really want to understand Birch Trees you have to begin with Birch Trees's job or function. This is because they have a great economic impact in this area.

The first major job or function of Birch Trees is they can be made into fences. Since they are so straight Birch Trees can be set in vertical rows easily. Besides their white bark makes them very attractive to look at. Since they are a hardwood they also last longer than other woods.

Another important job or function of Birch Trees is they make good firewood. Pieces of their bark can be lit up as kindling. The log itself is a hardwood and so makes a good hot fire. You have to be careful that the wood is dry though or it will cause chimney fire.

The last major job or function of Birch Trees is they make good canoes. Indians made the first Birch Bark Canoes. They were very light to carry and the bark was water proof. It was also simple to strip the bark for canoes with basic tools By stretching the bark over a frame a useable canoe could be made in 6 hours.

Wresch's program, written under an Apple contract (Apple Education Foundation), constitutes but one part of the program at the University of Wisconsin Center to use the micro as "both a teaching and writing tool." Indebted to Burns, the program goes one step further in telling students about its intentions: in this case, to help in the writing of a descriptive essay (other modes can be selected, Wresch points out). The program is, however, unfinished, and Wresch will be increasing the range of questions, getting more development of ideas, and, he hopes, avoiding the "four-paragraph formula" by encouraging flexibility. He indicates that students enjoy using the program, particularly in small groups.

The common idea in such rhetorics or dialogue programs is talking out ideas on the screen. The best among them anticipate many responses and provide unobtrusive instruction in the dialogue form. It's apparent, of course, that such programs don't judge the quality of an answer though it might be said that Helen Schwartz' SEEN (Seeing Eye Elephant Network) (formerly called MARSYEBB) suggests that some kind of evaluation might be addressed through what's called the Electronic Bulletin Board.(68)

The purpose of SEEN is to get students to support generalizations about literature, in this case, about characters (the program could be modified to address other elements of fiction). Two related features stand out--the opportunity for revision at many points in the program based on the student's own answers, and the opportunity for revision after the main program is run, based on the responses of other students posted on "the bulletin board." The "board" is another part of the program which all students can access. SEEN functions both as a heuristic and a network and is the most imaginative of the "tutorials" in its conception of getting students to collaborate. Sample PRINTOUT (following) shows the kinds of questions that can be prompted by the program. Students can incorporate bulletin board responses into their own work and revise their answers. Although improving methods of invention, Schwartz admits that SEEN did not improve the selection and organization of ideas, a necessary part of composition which the program does not address. However, essays were longer, attrition rates lower, and grades somewhat higher than those of students in control groups. And finally, Schwartz notes, the program can be used as a research tool to study "the composing process." Less expensive than videotape, less intrusive than traditional protocols, and easier to schedule as an activity, SEEN, though still in the development stage, shows the direction in which many "interactive" programs can go, in involving both teachers and students in the early crucial stages of writing. For actual composition and editing, there are other kinds of programs--and word processing. (see p. 56)

```
WHAT FICTIONAL PERSON DO YOU WANT TO DESCRIBE?
(LIMIT YOUR ENTRY TO 13 SPACES.)
> SATAN

WHAT LITERARY WORK DOES SATAN APPEAR IN?
> (LIMIT = 15 SPACES.)
PARADISE LOST

OK, NOW DESCRIBE THE CHARACTER OF SATAN IN PARADISE LOST
BY COMPLETING THE FOLLOWING SENTENCE USING 20 SPACES OR LESS:

SATAN IS TRICKY

WE JUDGE PEOPLE IN LITERATURE AS WE DO IN REAL LIFE:

--BY WHAT THEY DO
  (INCLUDING HOW THEY DRESS)
--BY WHAT THEY SAY
--BY THE WAY OTHERS REACT TO THEM
--BY COMPARISON TO OTHERS IN SIMILAR SITUATIONS
  (CONTRASTING EXAMPLE:
  HAMLET'S REVENGE OF HIS FATHER IS SLOWER THAN LAERTES' REVENGE.
  PARALLEL EXAMPLE:
  EDGAR, LIKE CORDELIA, HELPS HIS FATHER, EVEN AFTER DISINHERITANCE.)

PRESS RETURN KEY TO CONTINUE--READY?   (cr )
```

```
ALSO, IN LITERATURE, WE SOMETIMES HAVE INFORMATION FROM AN
IMPERSONAL NARRATOR (CALLED A '3RD PERSON' NARRATOR).
A 3RD-PERSON NARRATOR CAN TELL US ABOUT A CHARACTER'S
INNER FEELINGS.  PRESS RETURN KEY TO CONTINUE--READY?  (cr)

NOW I'LL ASK YOU TO PROVIDE SPECIFIC EXAMPLES OF
THESE KINDS OF EVIDENCE TO DEVELOP YOUR IDEA THAT
SATAN IN PARADISE LOST IS TRICKY

HOW DO OTHER CHARACTERS REACT TO SATAN THAT SHOWS

SATAN IS TRICKY?  (TYPE ZZ TO END.)

7 > ADAM REALIZES THAT THE SERPENT HAS TRICKED EVE ONCE SHE TELLS
    HIM HER STORY
8 > GOD HAS ORIGINALLY THROWN SATAN OUT OF HEAVEN BECAUSE HE DIDN'T
    TRUST HIM
9 > GOD MADE THE SERPENT CRAWL ON ITS BELLY BECAUSE OF THE WRONG
    IT COMMITTED
10 >  (cr)

TYPE L (TO LIST), A (TO APPEND), D(ELETE), C(HANGE),
  OR PRESS RETURN TO CONTINUE:  (cr)

HOW DO OTHER CHARACTERS (IN A SIMILAR SITUATION) ACT
 AND HOW DOES THIS COMPARISON SHOW THAT SATAN IS TRICKY?
 (TYPE ZZ TO END.):

10 > THE OTHER ANGELS DO NOT COMPARE THEMSELVES TO GOD AND ARE
     NOT THROWN OUT
11 > (cr)

TYPE L (TO LIST), A (TO APPEND), D(ELETE), C(HANGE),
 OR PRESS RETURN TO CONTINUE:  (cr)

IN PARADISE LOST, IS THERE A 3RD PERSON NARRATOR (THAT IS,
AN IMPERSONAL/ONCE-UPON-A-TIME NARRATOR) (Y/N)?  Y

WHAT DOES THE NARRATOR SAY THAT SHOWS SATAN IS TRICKY?
 (TYPE ZZ TO END.)

11 > HE  SAYS THAT SATAN CHOOSES THE SUBTLEST OF BEASTS FOR HIS
     EMBODIMENT
12 > HE SAYS THAT SATAN EASILY CONVINCED HER TO EAT FROM THE TREE
13 > HE SAYS THAT SATAN MUST FIND EVE ALONE BECAUSE ADAM WILL SEE
     THRU HIS TRICKS
14 > (cr)

TYPE L (TO LIST), A (TO APPEND), D(ELETE), C(HANGE),
 OR PRESS RETURN TO CONTINUE:  (cr)
```

* * *

```
HI, KAMI
WELCOME TO THE NETWORK.  (THE BULLETIN BOARD)

I'LL LIST CURRENT NOTICES AND COMMENTS.
THEN YOU CAN CHOOSE TO:
 SEE NOTICES (& SEE OR ADD COMMENTS)
 REVISE YOUR OWN NOTICE, CR END THIS SESSION.

PRESS RETURN KEY TO CONTINUE--READY?  (cr)


     ***LIST OF NOTICES AND COMMENTS***

NOTICE 1 = SATAN IN PARADISE LOST IS:  TRICKY SAYS KAMI
NOTICE 2 = ...IMMORAL SAYS HELEN
NOTICE 3 = HAMLET IN HAMLET IS:  FOOLISH SAYS ZAPION
NOTICE 9 = SATAN IN PARADISE LOST IS:  CLEVER SAY TELFON
  <<<NETWORK MENU SELECTION>>>
--------
S = SEE NOTICE (& SEE OR ADD COMMENTS)
R = RUN S.E.E. TO MODIFY/MAKE NOTICE
E = END THIS SESSION

WHICH DO YOU WANT TO DO (S, R, OR E)?  S

DO YOU WANT TO SEE THE LIST AGAIN (Y/N)?  N

TYPE IN THE NUMBER OF THE NOTICE YOU WANT TO SEE:  9

TELFON SAYS THAT SATAN IN PARADISE LOST IS CLEVER
DOES:
HE MANIPULATES EVE AND GETS HER TO EAT FROM THE TREE

HE PRESENTED HIMSELF AS A SERPENT
OTHERS:
EVE IS FOOLED MANY TIMES BY HIS CLEVERNESS
HOWEVER:
HE CONTRADICTS HIMSELF SLIGHTLY WHEN HE TRIES TO GET EVE TO EAT
FROM THE TREE
NO COMMENTS YET ON TELFON'S NOTICE

DO YOU WANT TO ADD A COMMENT (Y/N)?  Y

ADD YOUR COMMENT ON TELFON'S NOTICE
TYPE A MAXIMUM OF 2 LINES AFTER EACH PROMPT MARK
WHEN YOU'RE THROUGH, TYPE ZZ TO END
I AGREE.  SATAN IS CLEVER, HOWEVER HE MUST USE LIES TO
ACHIEVE WHAT HE WANTS
```

WORD PROCESSING.

Ugly term. Processing words suggests what's done to meat and cheeses (and with what results). Nonetheless, it's a servicable term, for what "word processing" is, is the working over of text on a CRT, from composing

through editing and proofreading. Word processing, declares Money Magazine "is the only area in which the personal computer has indisputably improved upon the old ways of doing things." (52)

Computers have word processing capabilities, but you don't have to own a computer to do word processing. In fact, you can buy hardware, a word processor, that is fitted out to do the job. It's the more efficient machine for that purpose. Certainly for those who are sure they will do only word processing, the hardware will be a good purchase. Word processors are easier to use than personal computers. Word processor KEYBOARDS (one KEYSTROKES instead of types) have keys designated for certain functions whereas many personal computer keyboards must do double function since word processing is only one of many uses.

Some word processing programs are easier to learn than others,(1) though some that are time-consuming, like WORDSTAR, are said to be worth the effort. Unlike a word processor, a PC can accept different SOFTWARE (word processing programs). Apple, for example, takes "Magic Window" a relatively easy program to learn, as compared with "Screenwriter II" which demands many hours of study. Users need to know in advance how much writing they will be doing, how many editing functions they may need, and what software will best do the job. And then, manuals should be looked at carefully--most are notoriously poor: unnecessarily complicated and, in several cases, downright inadequate.(12) Word processing has been known to lead many an English teacher into areas humanists fear to tread, but a poorly documented program will only prove intimidating. It's a point worth keeping in mind since many English teachers get to see word processing only at their universities and universities tend to invest these days in micros, not word processing machines. However, it should be pointed out that word processing software for micros is getting better all the time. And some programs, like the Bank Street Writer,(1) are excellent for those who are truly fearful; it can be learned in an hour.

Technically, word processing is not instruction, but it is most definitely an aid. Mason Cooley (English, College of Staten Island), who has a TRS-80 Model III in his home and who teaches technical writing for computer science majors, notes that everyone in his department is interested in word processing, and he, himself, is a strong advocate of its abilities to aid revision, expansion, and flexibility. (20)

"Word Processing and the Writing Program" was a special seminar at the Winter, 1982 MLA Convention, and even where there is no immediate chance for funding micros, there is constant talk about the subject and almost universal enthusiasm about its value.

At John Jay, Ira Pfeffer (English) who had a police writing project a few years ago, wishes he had known then about word processing. Pfeffer, who teaches "management writing" and "advanced professional writing" -- non-academic writing for professional purposes--sees word processing as essential to instruction. (60) Ideally, he would like all students to have access to a terminal or micro, both to enter and to edit text, but he has no preference between them: "If the word processing program is friendly and effective," he says, "it doesn't matter whether the student is using a micro or is linked up to a mainframe." The advantages of di-

rectly entering text on a CRT, playing with it, working at one's own pace, getting out immediate hardcopy, are obvious but the instructor also benefits by giving over to the computer the "onerous chore" of collecting, marking, returning, and collecting again, Pfeffer notes. Word processing, he concludes, facilitates the writing process in a non-threatening way, accommodates revisions that are easy to read, and encourages proofreading.

Those English departments lucky enough to have had individual faculty members with computer expertise and enthusiasm for word processing have reaped some of the benefits recent converts now want grants to cover: new courses, old courses updated with word processing, and faculty retraining.

Terry Langendoen (English, Brooklyn), in addition to teaching computer science courses, has been offering an experimental section of freshman composition that uses word processing (he uses "Word Handler" on an Apple). Particularly interested in using computers for linguistic analysis for his own research, Langendoen sees word processing as an aid in helping English teachers become interdisciplinarians, a growing trend at CUNY and nation-wide. (41)

At Kingsborough Community College, John Manbeck has been using word processing in journalism courses and looks to increased use (by way of computers coming into the department) to unite English with the world of work.(48) A KCC program called Journalism and Print Media, designed for secretarial students, he points out, will combine typing (40 words per minute will be the minimum), word processing, and type setting and will constitute a unique academic program in the university, making CUNY graduates attractive to employers who want to save time and money.

At City College, Norman Levine (English), who has a background in engineering and who has developed technical writing courses for CCNY, reports that his English department has been "drooling" to get its hands on hardware, long the almost exclusive possession of the sciences. (44) Somewhat critical of CUNY's 57th Street facility, because of increased use and forbidding documentation, Levine hopes that when the department moves to a new location, word processing equipment will follow, but even then, he adds, whatever comes will not be enough. He talks of the "enormous appetite" in English departments for computers but also of the "extraordinary frustration" at trying to get terminals or micros. It's poor timing: English departments seem to have come of technological age just when the money supply is shrinking. Resources are scarce all around; equipment is notoriously outdated. Given the fact that huge computer-science departments such as Queens College's can hardly keep up, what can English departments hope for? How many individual faculty will go out and purchase their own machines? How fast will micro prices come down? What should Universities do to help their individual colleges--or colleges do to help departments of English? Universal interest in word processing is forcing such issues.

Where there has been the most work done with word processing is where there have been micros for several years, and English teachers who have been using word processing programs for some time are now publishing arti-

cles about their benefits as aids to instruction. Much of that activity, nationwide, has been concentrated in the west and midwest.

In a paper delivered before the Winter 1982 MLA Conference, University of Wisconsin Professor Eleanor Berry likens writing on a word processor to holding a lively conversion. She says that when she uses word processing, she feels as though she is in a "dynamic interchange" with the computer.(2) Dramatic? Perhaps, but typical of what many users express is the difference between an electronic draft and a long yellow writing tablet, even an IBM selectric. A word processor, Berry says, is faster and more stimulating. And, one might add, cheaper, considering the vast quantity of paper discarded in writing drafts. The testimony of personal users seem universal--Isaac Asimov's among the better known--but favorable reports from teachers who have used word processing as aids to instruction seem just as extensive. Although Robert Taylor (The Computer in the School) points out that word processing should not be described as a tool for instruction but rather as an "exploratory problem-solving device,"(76) his distinction may be irrelevant if teachers can show that word processing makes a difference in the quality as well as the quantity of composition. Word processing advocates say it does.

Here's the Director of Studies at Groton School, Groton, Connecticut: "The student learns to think behind the keyboard." And because he can alter his thinking quickly, neatly, indefinitely, the student "finds that writing is faster, easier and much less time-consuming than he thought." Result? The student will write more, revise more. "This is not Pollyanna speaking," the director adds. "So far, every student that I know of who has learned to use the word processor has shown an improvement in writing." Sometimes, it's slight, more often than not, "significant." In no case is there decline! The result for the instructor is equally significant. Getting more and better writing, the instructor will demand more. It's not just that word processing helps, the director concludes, but that it's "foolish to waste time if there is an easier and more efficient method." (29)

It might be argued that Groton's students are hardly CUNY's, but it is often the fearful and underprepared student who is said to benefit most from composing on a computer, and the introduction of very simple word processing programs such as the Bank Street Writer, touted in The New York Times, suggests that what writer Erik Sandberg-Diment's sixth grade daughter could "conquer" in less than an hour, even the most remedial student could learn. (66)

Working alone, at one's own pace, changing one's mind endlessly, being "neat"--one has the sense of being in control of language. More than that, some say, word processing is the closest we'll ever get to bringing "the process of production of a text into much closer accord with the natural mental process of generating verbal discourse" (3) meaning that word processing will allow us to produce writing in accord with the way we think--visually. Some experiments have proceeded on that assumption. In one, students try to construct a geometric figure on the screen by describing position and direction that will approximate the computer's model. (22)

In another experiment, word processors are being used to explore "invisible writing" an idea proposed by Stephen Marcus and Sheridan Blau at the University of California (Santa Barbara) and based on the idea that "the absence of visual feedback" sharpens concentration on each writing task, enhances fluency, and yields texts that are "more rather than less cohesive."(50) Without being allowed to pause, edit or rewrite, say Marcus and Blau, the student is forced to give undivided attention to their thoughts, regardless of the rhetorical mode that will finally be seen to contain them. "Simply by adjusting the contrast and brightness knobs on word processors people may eliminate the immediate visual feedback yet still be recording their text." The experiment, used in first-year English at the University, was specifically tailored for students in the Educational Opportunity Program and yielded favorable results, assert Marcus and Blau. The technique, they say, tended to combat writer's block in the inexperienced and to strengthen the substance of early drafts. In any case, for whatever it's worth (it's difficult to judge from an academic essay about the experiment) the idea focuses on the composing stage of writing where increasing numbers of English teachers are placing their attention.

A word of caution, however, should be sounded about word processors as CAI. Two papers delivered at the 1982 MLA Convention both include qualifications for enthusiasts.

In "Writers' Perceptions and What the Record Shows," Parker Johnson, from the University of Minnesota (38), reports on an experiment he conducted with graduate student composition teachers who used "Wordstar," all of whom were competent typists. Although his students were far from typical or representative of a CUNY population, his conclusions are worth noting for what they may suggest about expectations in the design of a writing curriculum using CAI. What Johnson and his fellow researchers found was that word processing did not alter the composing process, but rather reflected each writer's own writing behavior; that is, depending on whether his subjects did a lot of prewriting or edited as they went, attitudes toward composing on the CRT were vastly different, and so, too, output. In his experiment, the "prewriters" felt frustrated while the "editors" used the machine to best advantage. These were graduate students it should be remembered; for freshmen, the cautionary notes should be sounded louder.

Johnson's colleague, Paula Reed Nancarrow,(54)--"Integrating Word Processors into a Freshman Composition Curriculum"--sounds some of them. A student composing on a CRT screen, who sees only twenty odd lines of text at a time, may have difficulty producing coherent text, and may need to be told to edit on hard copy she points out, one of a number of important remarks she makes for English teachers considering word processing for the freshman English class. There's the obvious problem, for example, of acquainting students with the machine itself, instruction that should be given by the English teacher in a section of a computer lab marked off for writers. There is also the need to adjust the "writing process" to the CRT: What English teachers tend to treat separately in the traditional classroom--pre-writing, composing, drafting, revising and editing--may all become "simultaneous" activities on the screen. Then, too, English teachers may have to become administrators(or clerks), insuring that an

adequate supply of micros and printers will be available, and that students with part-time or work schedules can be accommodated to best advantage. Nancarrow recommends a minimum of three to four hours a week, with individual sessions an hour long and, as much as possible, back-to-back. Teachers must be ready to make constant scheduling adjustments, see to it that security is tight, and that lab technicians, knowledgeable about writing, are on call. Then there is the additional burden of having good "documentation." English teachers most certainly would have to do some writing of their own, not only because most of the manuals are wordy and inaccurate, but because they are confusing or hard to read. Although Nancarrow tends to dismiss the problem of typing, this, too, may be a stumbling block for the English teacher to consider. Two-finger manipulation on a typewriter has a long successful history, but inability to touch type for word processoring may prevent an efficient and confidant use of the machine.

Despite these caveats the judgment so far would seem to be that the advantages of using computers for composing (including software packages that address pre-writing) far outweigh the disadvantages. What increasing attention to the use of computers for writing has accomplished is to focus attention more and more on the whole pedagogical problem of using computers. English teachers see that beyond the considerations of software selection lie the more complicated problems of integrating CAI into the curriculum in a way that will not sacrifice valuable classroom time.

CRITICAL THINKING

Just as the back-to-basics movement was getting started in the seventies largely in response to media-hyped public outcry, English teachers, like math teachers slightly before them, were asking themselves what was really basic. They concluded, many of them, that it was a skill not easily measured, one that took a long time developing, and one that might not even be capable of being taught. That skill, or collection of skills, is what teachers variously refer to as "critical thinking," "problem-solving," or "reasoning." In English, its presence (or absence) accounts for the sense that a written work, regardless of purpose, rhetorical mode, level of complexity, of style, is an organized development of a main idea (or not). Whether such skills can be taught as a set of strategies; whether they should be included in existing courses and made species-specific, so to speak, or whether they should constitute a separate course; whether they would be better taught before, along with, or after the mechanical features of basic skills are emphasized--these are matters of recurrent debate. Informal observation suggests that such logical emphases are being addressed now mostly in separate "critical thinking" courses, with subject matter and techniques borrowed from philosophy and math. Given the growth of computers in the Humanities as well as the increased attention to "computer literacy" for all, it should come as no surprise that "logic software" and "rhetorical discourse" programs as well as text editors that stress sequence and organization have become important directions in CAI. (84)

At Carnegie-Mellon University, Preston Covey, Jr. and others have been developing programs to teach "first-order logic" that can be applied to philosophical arguments (only for mainframes, so far). Called ANALYTICS, the programs deal with logic, symbolization, truth value analysis, and argument. (21) Offered as part of the English and Rhetoric program at Carnegie-Mellon, they reflect its goals: "...that the computer be exploited to meaningfully address concerns in both the craft and art of writing." ARGUE, for example, gives problems for analysis in dialectical reasoning. Other programs, LOGIC, EPISTEMOLOGY, and RHETORIC, designed for upperclassmen, integrate writing and philosophy and are used in conjunction with team-taught interdisciplinary courses. DRAFT, a more "English-oriented" part of the program, is described by its designer, Christine M. Neuwirth, as "A Computer-Based Writing Aid" for teachers who don't know computing." (56)

DRAFT consists of three main parts: Creating a Composition, Creating an Instruction file; and Editing a Text file. In the first, students can put up new text or edit previously created essays. DRAFT resembles "prewriting" programs in that it asks questions intended to guide thinking, but it seems to be a more extensive system: it accepts long and short answers and incorporates revision along with answers intended to clarify the nature of rhetorical discourse. In other words, DRAFT would appear to be both a dialogue and a text editor (to be used, if so desired, along with Brian Reid's SCRIBE, a document preparation system which is also part of the series).

Still being debugged, CMU's COMPOSITION CREATOR is also intended to provide help for different kinds of rhetorical discourse. A first part, INSTRUCTOR, will call up a paragraph definition of the type of discourse indicated in an assignment-- a policy paper, for example, will elicit a statement written by the instructor that will define what a policy paper is, or should do, indicate why it is significant, and what its mode requires in way of content or style. Then, specific questions designed by the instructor follow. Only short answers, which "the computer" will respond to with YES or NO, are "interpreted" by the program--that is, the answers in these cases will be right or wrong. Long answers usually become part of the draft. The Carnegie-Mellon programs, written by faculty from different disciplines who sometimes team teach, are part of an interdisciplinary program in writing and computer science that includes a newly-formed Automated Writing Skills Center for particular use by freshmen and those requiring remediation.

Although CUNY has nothing as extensive, individual English teachers at various campuses have been moving in similar directions. It's been seven years, for instance, since H. Lee Gershuny (English, Borough of Manhattan Community College) published "Problem-Solving in Interdisciplinary Programs: Literature and the Age of Technology," a proposal for linking English and Data Processing. (27) Part of the proposal is for a course, "Computers and Society," that would require in-class writing, debates, discussions, and use of computers. It would be taken by both humanities and science majors who had completed freshman English. A unique feature would be the writing of both computer programs and English prose in order to compare and contrast language as a "system of inquiry", meaning logical modes. (The computer languages Gershuny has in mind are BASIC and FORTRAN.) "If students were asked to translate a poem by John Donne into a computer language," Gershuny speculates, "they would also learn, in the process, that there are things you can't translate." Then again, there might be some basic patterns of agreement between them. The course would truly be interdisciplinary, not the usual juxtaposition of subject matters that so often marks two-culture experiments. A goal would be to show that logical thinking belongs to English just as poetic expression often finds its natural way into writing about science and the technologies. Unfortunately, as Gershuny points out, because of budget cutbacks, the course was never given when it was conceived. Now, several years and a brand new campus later, as well as general interest in the English department, the proposal has been revived. Gershuny is also chairing a committee to look into software development in English, including programs for word processing and journalism.

JOURNALISM

Because print journalism emphasizes writing skills in contexts that are predetermined--inverted pyramids, fact patterns, agreed-upon rules and conventions according to Associated Press and UPI stylebooks--(58) it is a natural consideration for CAI: CAI programs in journalism can easily address questions of accuracy and style.

Interested in studying paragraphs and the "specific rules which account for the language user's production and recognition of sentences in a connected discourse," Stanley W.Y. Su and Robert L. Moore at the Universi-

ty of Florida (Gainsville) have been using short news stories written for journalism courses to study "structural and semantic relationships." (75) Relationships are then formalized and used to help teach concepts of journalism. In other words, Su and Moore use computers to help create a model (subject to modification) which is used for instruction (an oversimplification of an extremely involved part of research-in-progress that may be of more immediate interest to transformational grammarians than to writing teachers). Similar, but simpler to understand, is Robert Bishop's well-developed program at The University of Michigan called JOURNALISM which has been in use since 1969 as part of a beginning news writing course in the Department of Journalism. (4)

In one sense, Journalism Computer Assisted Instruction (JCAI) is text editing according to "readability" formulas devised by journalism teachers, but it also involves checking for main and subordinate details, their order, their spelling and grammatical form. JCAI, which requires no experience in programming, has four parts: 1) a general program of specific exercises, to which a teacher can add: "The instructor merely indicates key words he wants to check -- accompanying comments depend on the order, presence or absence of the words; 2) a stylistic analysis of clarity, readability, mechanics (which can be used with the exercises or on its own); 3) a spelling check against a dictionary of 17,000 entries (which can be added to); and 4) a clerical routine which tracks different kinds of errors and gives students an up-to-date record.

SAMPLE RUNS OF JOURNALISM PROGRAMS
(BISHOP, UNIVERISTY OF MICHIGAN)

SAMPLE STORY A ENTERED INTO THE COMPUTER

THE DESTROYERS USS AMMAN AND USS COLLETT COLLIDED THIS MORNING THREE MILES OFF THE CALIFORNIA COAST AT NEWPORT BEACH. ELEVEN MEN WERE REPORTED KILLED WITH AT LEAST SIX OTHERS INJURED.

THE COLLISION OCCURRED IN A FOG THAT LIMITED VISIBILITY TO LESS THAN A QUARTER OF A MILE. THE FOG HAS ALSO HAMPERED RESCUE EFFORTS BY HELICOPTERS.

A SEAMAN OF THE AMMAN CLAIMED, "THE COLLETT HIT US MIDSHIP AND RIPPED THE SIDE OPEN, JUST LIKE IT HAD BEEN DONE WITH A GIANT CAN OPENER. I WAS BELOW IN THE ENGINE ROOM AND THERE WAS NO WARNING. THE WATER CAME POURING IN."

ONE NAVY SOURCE IN LOS ANGELES SAID THAT THE AMMAN'S REAR ENGINE ROOM WAS FLOODED WITH WATER POURING IN THROUGH A HOLE IN THE PORT SIDE. THE BOW OF THE COLLETT IS REPORTED TO BE DAMAGED.

EFFORTS ARE BEING MADE TO TOW THE HEAVILY LISTING AMMAN TO LONG BEACH. A FIRE THAT BROKE OUT AFTER THE COLLISION WAS QUICKLY BROUGHT UNDER CONTROL.

SMALL CRAFT FROM NEWPORT BEACH SPED TO THE SCENE AND BROUGHT INJURED AND DEAD ASHORE.

THE AMMAN WAS HEADED FOR SAN DIEGO AND DEACTIVATION WHEN IT WAS STRUCK.

THE COLLETT WAS CONDUCTING SEA TRIALS AFTER AN OVERHAUL AT THE LONG BEACH SHIP YARD.

THE INJURED HAVE BEEN TAKEN TO HOAGUE MEMORIAL HOSPITAL. THEIR IDENTITIES AND THOSE OF THE DEAD ARE BEING WITHHELD.

COMPUTER ANALYSIS OF SAMPLE STORY A

IDENTIFY THE DESTROYERS BY BASE AND FLOTILLA NUMBER AND REPORT ANY DAMAGE EARLY IN THE STORY UNLESS YOU HAVE VERY GOOD REASONS FOR NOT DOING SO.

FINE. I SEE THAT YOU HAVE MENTIONED WHAT THE DESTROYERS WERE DOING BEFORE THE COLLISION.

I DO NOT FIND WILLIAM WILDER'S NAME. DID YOU LEAVE IT OUT OR MISSPELL IT? USE AS FULL AN IDENTIFIER AS AVAILABLE.

GOOD. YOU HAVE MENTIONED THE HOSPITAL WHERE THE INJURED WERE TAKEN. THIS IS AN IMPORTANT DETAIL FOR READERS WITH RELATIVES WHO MAY HAVE BEEN INJURED IN THE COLLISION.

WHY DID YOU OMIT THE SIZE OF THE SHIPS AND THE NUMBER OF CREWMEN? THESE DETAILS, AFTER THE OTHER FACTS ARE GIVEN, INDICATE SOMETHING ABOUT THE MAGNITUDE OF THE ACCIDENT AND DAMAGES.

YOU MAKE YOUR WRITING MORE DIFFICULT BY USING TOO MANY PASSIVE VERBS. TRY CHANGING THESE TO ACTIVE VOICE, PRESENT TENSE. CHANGE 4 OR MORE TO ACTIVE VOICE.

CHECK SENTENCES 2, 8, 9, 10, 13, 15.
EXAMPLE, SEE SENTENCES
10 - 11 - 12
12 - 13 - 14

SENTENCES CONTAINING VERBS OF BEING, 20.0%
SENTENCES CONTAINING PASSIVE VERGS, 16.7%
DESCRIPTIVE ADVERBS IN TOTAL WORDS, 0.9%
INDIRECT OR WORDY SENTENCES, 7.7%
SENTENCE SIMILARITY MEASURE, 13.3%
YOUR AVERAGE SENTENCE LENGTH IS 14.1 WORDS.

SOME OF YOUR SENTENCES APPROACH THE MAXIMUM DESIRED LENGTH. CHECK THEM TO SEE IF THEY CAN BE CONDENSED. IF THEY CANNOT, YOU MAY WISH TO BREAK THEM INTO TWO SENTENCES.
CHECK SENTENCES 5, 8

THIS CONCLUDES THE ANALYSIS OF YOUR STORY. THE COMPUTER MAY HAVE MISSED SOME IMPORTANT ELEMENTS, OR MAY NOT HAVE RECOGNIZED SOME OF THE KEY PHRASES WHICH YOU USED. CORRECT THE STORY ACCORDING TO THE COMMENTS AND YOUR OWN BEST JUDGMENT, AND THEN COMPARE YOUR VERSION WITH THE MIMEOGRAPHED STORIES DONE BY OTHER STUDENTS.

SAMPLE STORY B ENTERED INTO THE COMPUTER
(from an English Composition Class)

ONE OF THE LEAST PROTESTED ORDEALS THAT THE AMERICAN PUBLIC HAS BEEN SUBJECTED TO HAS BEEN THE PROCEDURE OF FUNERAL ARRANGEMENTS AND BURIAL. THE REASONS FOR THE LACK OF VOLATILE CRITICISM ARE MANY, THUS GIVING THE COALITION OF FUNERAL DIRECTORS IN AMERICA THE UPPER HAND IN DEALING WITH THESE MATTERS.

FUNERAL PREPARATIONS CAN BE AN ORDEAL AND TO THE MAJORITY OF THE PUBLIC IT IS DEFINITELY ONE. ALTHOUGH THE AMERICAN PUBLIC MAY FEEL THAT THEIR CUSTOMS AND TRADITIONS CONCERNING THE BURIAL OF THEIR LOVED ONES TO BE THEIRS ALONE, THEY WOULD BE SURPRISED TO FIND THAT THESE CUSTOMS AND TRADITIONS HAVE BEEN DICTATED BY FUNERAL DIRECTORS FOR THEIR COMMERCIAL BENEFIT. SELDOM IS THE INDIVIDUAL'S IDEA OF THE PERFECT BURIAL HIS OWN. FOR YEARS FUNERAL DIRECTORS HAVE CAPITALIZED ON THE UNPREPAREDNESS OF THE BEREAVED. UNLESS HAVING PREVIOUSLY EXPERIENCED A DEATH IN THE FAMILY, THE AVERAGE CITIZEN IS TOTALLY IGNORANT OF THE HIGH COST INVOLVED IN A FUNERAL. JESSICA MITFORD IN HER BOOK, "FROM THE AMERICAN WAY OF DEATH," QUOTES THE AVERAGE UNDERTAKER'S BILL AS IN THE NEIGHBORHOOD OF $1,450. SHE GOES ON TO SAY THE AVERAGE CITIZEN IS FORCED TO MAKE A QUICK DECISION ALTHOUGH HE IS TOTALLY UNPREPARED FOR SUCH, AND RELIES ON THE ADVICE OF THE WORST PERSON POSSIBLE--THE FUNERAL DIRECTOR. UNDER A BARRAGE OF APPEALS TO "AMERICAN TRADITION," KEEPING UP WITH THE JONESES, AND SENTIMENTAL AFFECTION FOR THE LOVED ONE, THE UNFORTUNATE CONSUMER CONSENTS TO A SERVICE FAR EXCEEDING HIS WANTS OR NEEDS, BOTH PRACTICALLY AND FINANCIALLY.

HOW HAS THE BOOMING BUSINESS REMAINED ABOVE PUBLIC CRITICISM? LORD ESSEX SAYS THAT THE AVERAGE UNPROTECTED CITIZEN HAS NEITHER THE MORAL COURAGE TO SPEAK AGAINST OR ACT IN DEFIANCE OF THESE PSEUDO AMERICAN CUSTOMS AND TRADITIONS. ALSO, THESE PEOPLE ARE CONFRONTED WITH THIS ORDEAL USUALLY JUST ONCE, AND ARE UNWILLING TO MOUNT AN OFFENSIVE AGAINST SUCH A DISTANT PROBLEM.

TO COMBAT THIS GROWING INJUSTICE IN AMERICA THE PUBLIC SHOULD BECOME AWARE OF THE SITUATION. EACH PERSON SHOULD DECIDE WITH HIS FAMILY THE PROCEDURE THEY WILL TAKE SO THAT WHEN THE TIME COMES THEY CAN BETTER COPE WITH PROBLEMS OF BURIAL.

COMPUTER ANALYSIS OF SAMPLE STORY B

THIS WAS A DIFFICULT ASSIGNMENT. YOU WERE ASKED TO GIVE A COMPRESSION OF THE EVIDENCE IN JESSICA MITFORD'S BOOK THE AMERICAN WAY OF DEATH AS PART OF A PERSUASIVE EDITORIAL TO CONVINCE YOUR READERS THAT FUNERAL PRACTICES SHOULD BE CHANGED. THE COMPUTER HAS BEEN PROGRAMMED TO CATCH ERRORS AND OMISSIONS AND SUGGEST WAYS YOU CAN REVISE YOUR EDITORIAL; USE THE COMMENTS YOU FIND USEFUL.

IT WAS GOOD THAT YOU REFUTED THE TENET THAT ELABORATE FUNERALS ARE IN THE "AMERICAN TRADITION."

THE CASE OF MR. AUGUST CRELINI WAS USED BY JESSICA MITFORD TO PROVIDE HUMAN INTEREST AND BUILD PERSONALIZED OUTRAGE AT THE LIES AND OTHER DECEPTIONS USED TO BILK BEREAVED RELATIVES. IF YOU DID NOT REFER TO THIS CASE STUDY, DID YOU PROVIDE SOME OTHER EVIDENCE TO ACHIEVE THIS SAME RESULT?

YOU WERE ASKED TO AROUSE PUBLIC SENTIMENT FOR REFORM. IF YOU DID NOT MENTION "FUNERAL SOCIETIES" OR "MEMORIAL ASSOCIATIONS" WHICH ARRANGE FOR PRE-PLANNED "DIGNIFIED FUNERALS AT A REASONABLE COST," DID YOU RECOMMEND SOME OTHER SOLUTIONS TO THE PROBLEM?

BOOK TITLES ARE ALWAYS UNDERSCORED, SO THE REFERENCE TO MISS MITFORD'S BOOK SHOULD BE TO THE AMERICAN WAY OF DEATH, UNDERSCORED. OUR TEXT GAVE THE EXCERPT THE CHAPTER HEADING "FROM THE AMERICAN WAY OF DEATH," BUT YOUR CITATION SHOULD BE TO THE BOOK ITSELF.

CURRENT TYPOGRAPHY REQUIRES THAT PERIODS AND COMMAS ALWAYS COME WITHIN THE CLOSING QUOTATION MARKS.

THE CLICHE, "KEEPING UP WITH THE JONESES" USES THE PLURAL FORM OF THE NAME JONES.

EDITORIALS ARE USUALLY GIVEN TITLES, SO IF YOU DIDN'T HAVE TIME TO THINK OF ONE TRY TO DESIGN SOME SHORT AND EYE-CATCHING TITLE FOR THE REVISED ESSAY.

REPLACE SOME OF YOUR "TO BE" VERBS FORMS, "IS," "WAS," "AM," "ARE," "BEEN," ETC., WITH VERBS SHOWING MORE ACTION.
REPLACE 1 OR MORE WITH ACTIVE VERBS.
CHECK SENTENCES 1, 4, 9, 13

YOU MAY BE USING TOO MANY ADVERBS AND ADJECTIVES INSTEAD OF FINDING THE VERB OR NOUN WHICH SAYS EXACTLY WHAT YOU MEAN. EXAMINE 4 OR MORE OF THEM IN YOUR STORY. SEE IF YOU CAN IMPROVE THE SENTENCE:

> ALTHOUGH THE AMERICAN PUBLIC MAY FEEL THEIR CUSTOMS AND TRADITIONS CONCERNING THE BURIAL OF THEIR LOVED ONES TO BE THEIRS ALONE, THEY WOULD BE SURPRISED TO FIND CUSTOMS AND TRADITIONS HAVE BEEN DICTATED BY FUNERAL DIRECTORS FOR THEIR COMMERCIAL BENEFITS.

NEWSPAPER STYLE GENERALLY ELIMINATES THE COMMA BEFORE "AND" AND "OR," ESPECIALLY IF CONNECTING ITEMS IN A SERIES.
CHECK SENTENCES 9, 10-13

SENTENCES CONTAINING VERBS OF BEING, 33.3%
SENTENCES CONTAINING PASSIVE VERBS, 40.0%
DESCRIPTIVE ADVERBS IN TOTAL WORDS, 1.7%
INDIRECT OR WORDY SENTENCES, 38.5%
SENTENCE SIMILARITY MEASURE, 0.0%

YOUR AVERAGE SENTENCE LENGTH IS 23.4 WORDS.

SOME OF YOUR SENTENCES APPROACH THE MAXIMUM DESIRED LENGTH. CHECK THEM TO SEE IF THEY CAN BE CONDENSED. IF THEY CANNOT, YOU MAY WISH TO BREAK THEM INTO TWO SENTENCES.
CHECK SENTENCES 4, 9, 10

SOME OF YOUR PARAGRAPHS ARE DEFINITELY TOO LONG. BREAK THEM INTO TWO OR MORE PARAGRAPHS IF YOU ARE SURE YOU CAN NOT CONDENSE THEM.
CHECK PARAGRAPH 2

THIS CONCLUDES THE ANALYSIS OF YOUR STORY. THE COMPUTER MAY HAVE MISSED SOME IMPORTANT ELEMENTS OR MAY NOT HAVE RECOGNIZED SOME OF THE KEY PHRASES WHICH YOU USED. CORRECT THE STORY ACCORDING TO THE COMMENTS AND YOUR OWN BEST JUDGMENT, AND THEN COMPARE YOUR VERSION WITH THE MIMEOGRAPHED STORIES DONE BY OTHER STUDENTS.

What's noteworthy about JCAI is that it is part of a course, not taking the place of one, and it can be used in conjunction with other media to teach news writing. The exercises themselves, Bishop notes, range from simple rewrite assignments to extensive reporting on an issue of national significance. Students type a story into a computer terminal and the JCAI program goes to work, scanning for key words or phrases, looking for main ideas, bias, accuracy, libel. The exercises all check for key names, titles and addresses. The program then goes on to scan sentence and paragraph length, number of passive verbs and other possible indicators of wordiness. The "analysis" gives statistical data and suggestions (see sample PRINTOUT). "Obviously," Bishop concludes, "the student receives far more guidance on each story than an overworked instructor can offer." Teachers correct less, students spend less time in class, and JCAI covers in 14 weeks what used to take 20 or 25. And no one's individuality seems "destroyed" by such "mechanized teaching" he adds.

To prepare a story for JCAI, Bishop instructs, one need only make a list of all key words or patterns and the comments they would evoke written out in English.

1. If 'ACHIEVE A MAXIMUM VELOCITY OF' appears, then comment: "REPORT THE WEATHER CONDITIONS MORE SUCCINCTLY. USE SYNONYMS FOR SUCH PHRASES AS 'ACHIEVE A MAXIMUM VELOCITY OF.'"

2. If 'USS' appears but neither 'USS AMMAN' nor 'USS COLLETT' appears, then comment: "USS STANDS FOR UNITED STATES SHIP. THEREFORE, IT IS USED ONLY AS PART OF A NAME, E.G. USS AMMAN."

3. If 'NEWPORT BEACH' does not appear in the first 30 words, then comment: "BE SURE TO REPORT NEAR THE BEGINNING OF THE STORY WHERE THE ACCIDENT OCCURRED."

4. If neither 'TODAY' nor 'THIS MORNING' appears in the first paragraph, then comment: "BE SURE TO REPORT NEAR THE BEGINNING OF THE STORY WHEN THE ACCIDENT OCCURRED."

5. If 'AMMAN' and 'COLLETT' and 'LONG BEACH' and either 'THREE' or '3' appear in the first 50 words, then comment: "GOOD. YOU HAVE IDENTIFIED

THE DESTROYERS BY NAME, BASE AND FLOTILLA NUMBER EARLY IN THE STORY. THIS IS IMPORTANT TO LEADERS WITH RELATIVES OR FRIENDS WHO MAY HAVE BEEN IN THE ACCIDENT."

6. If 'FROM', 'AFTER' or 'FOLLOWING' appears in the same sentence with 'BRAIN SURGERY', then comment: "ONE OF THE MOST SENSITIVE AREAS IN AN OBITUARY IS THE CAUSE OF DEATH. IF IT IS NOT KNOWN AND CANNOT BE LEARNED, AVOID IMPLYING THE CAUSE."

7. If 'ERNEST' or 'JOHN E' and 'JOSEPHINE' do not appear in the same sentence with 'PARENTS', the comment: "IT IS CUSTOMARY TO INCLUDE THE NAMES OF THE PARENTS OF THE DECEASED, IF KNOWN. HAVE YOU SPELLED THEM CORRECTLY?"

8. If 'TRANSPORATION' or 'PLANNED' appears without quotation marks, then comment: "NEWSPAPER STYLE IS TO USE QUOTATION MARKS AROUND BOOK TITLES. CHECK AP STYLE BOOK, IF IN DOUBT."

9. If '#' or '30' or 'END' does not appear in the last three words, then comment: "HAVE YOU FINISHED THIS STORY? I DON'T SEE THE END MARK."

10. If '#' or '30' or 'END' does appear in the last three words, then comment: "THANK YOU FOR MARKING THE END OF YOUR STORY."

11. After the other comments, comment: "IF THIS WERE YOUR OWN OBIT, WOULD YOU BE SATISFIED WITH IT? IF NOT, WHY?"

12. If the story exceeds 150 words in length, then comment: "ARE YOU SURE YOU CAN'T FURTHER SHORTEN YOUR STORY? READ IT CAREFULLY TO SEE IF THERE ARE UNNECESSARY WORDS OR DETAILS YOU CAN OMIT. TRY AGAIN TO CUT IT TO 150 WORDS OR LESS."

How do you specify the IF-THEN commands for each one of the examples above? Let us take them in order.

1. PATTERN 1: "ACHIEVE A MAXIMUM VELOCITY OF'
COMMENT 1: REPORT THE WEATHER CONDITIONS MORE SUCCINCTLY. USE SYNONYMS FOR SUCH PHRASES AS 'ACHIEVE A MAXIMUM VELOCITY OF.'
ENGLISH: If 'ACHIEVE A MAXIMUM VELOCITY OF' appears, then make comment 1.
LOGIC: If 1 then 1

The patterns and comments are referred to by number. The two occurrences of "1" here cause no confusion because the pattern numbers always come between the 'IF' and the 'THEN' while the comment number always follows the 'THEN'.

2. PATTERN 2: 'USS'
PATTERN 3: 'USS AMMAN'
PATTERN 4: 'USS COLLETT'

COMMENT 2: USS STANDS FOR UNITED STATES SHIP. THEREFORE, IT IS USED ONLY AS PART OF A NAME, E.G. USS AMMAN.

ENGLISH: IF 'USS' appears but neither 'USS AMMAN' nor 'USS COLLECT' appears, then make comment 2.
LOGIC: IF 2, 3, 4 THEN 2

A minus sign in front of a pattern number means "does not appear." The intention is to catch the error in "THE USS SHIPS AMMAN AND COLLETT COLLIDED..." instead of "THE SHIPS USS AMMAN AND USS COLLETT COLLIDED..." Note that 'USS' consists of four characters: 'U', 'S', 'S', and ' '

EDITING AND PROOFREADING

Although editing and proofreading programs have been around for some time, pre-packaged and homemade, the Bell Labs series, WRITERS WORKBENCH, is about as close as computers come to taking over the tasks of revision. The information these programs provide about diction, style, organization, even content, can be seen as either incredibly thorough and welcome, or overwhelmingly threatening and hostile to the process of composition as real writers know it to be (real writers being those who write, not just gather statistics). WRITERS WORKBENCH (WWB) is the most comprehensive and detailed series of "computer aids for text analysis" yet developed. EPISTLE, an IBM project, is still being modified and CRES, a system used by the Navy to help in the writing of technical manuals, is more specialized, though each has features that might appeal to English teachers who give courses in business or technical writing. WWB is more general.

Originally three programs (now known as DICTION, SUGGEST, and STYLE) designed to assist scientists at Bell write documentation for electronic hardware manuals, (14) WWB now totals over 30 programs that address all matters of editing and proofreading. Because of legal considerations, only three programs have been available for general viewing, but soon, developers say, more should be open for inspection. An exception was made for Colorado State University (CSU) which has been the official pilot study group for WWB for the last two years. Why CSU when many universities offered to test the program? Because the request came from the English department, not computer science, say Bell Labs developers, and staff there were "enthusiastic" about the experiment.

WWB runs under the UNIX operating system, a trademark of Bell Labs. With special permission, City University faculty can log on to UNIX and preview the three available programs. What they'll see may be startling: everything you've never wanted to know about your own writing (and some inevitable programming flaws).

WWB programmers stress the series' unique features. Unlike canned editing programs, they say, WWB works on a writer's own material; unlike programs which merely flag errors, WWB offers concrete suggestions for improvements; and unlike programs with alternatives built in, WWB is "open ended" allowing for modification. One program, MAKESTAND, even permits users to alter standards, the very "readability" criteria on which the programs are based. Since authoring is possible, users can also create their own formulas or dictionaries of misspelled words (and perhaps address the persistent problems plaguing some editing programs: printing out as errors, hyphens, abbreviations, and acronyms).

Developers say the WWB programs deal with "surface features of text" and do the "tedious jobs of a copy editor" (see attached PRINTOUT for what can be done on just one sentence.) The programs look for, find, print out and often suggest alternatives for, among other things, sentence and word length, sentence type, words of many syllables, cliches and word repetition. (87) Paragraph opening lines are also signaled as well as paragraph conclusions, split infinitives, punctuation errors, and stylistic conventions. The programs can be used separately or in a series, alone or with others, as part of a syllabus or as outside "reinforcement." At Bell they were used in a course, "Effective Writing in an Organization" (15 weeks, 30 hours). Scientists and engineers take the course, some of whom it is said (hard to believe) have little or no experience with computers. Instructors emphasize that it is the user who is in charge, not the program--a necessary reminder, perhaps, for those who look to use the WWB programs that address subtleties of style and tone. (32) WWB is a powerful tool that requires careful introduction. Here is sample PRINTOUT:

```
   Our report, "The Basic Fundamentals of Computatonal
Complexity", is enclosed.  Please send any recomended
changes at your earliest convenience.  thanks.

-------------------------SPELLING---------------------------------
Possible spelling errors in examplefile are:
Computational                       recommended
If any of these words are spelled correctly, later type
        spelladd word1 word2 ... wordn
to have them added to your spelldict file.

------------------------PUNCTUATION-------------------------------

The punctuation in examplefile is first described.
2 double quotes and 0 single quotes
0 apostrophes
0 left parentheses and 0 right ones

The program next prints any sentence that it thinks is incorrectly
punctuated and follows it with a correction.

line 1
OLD:  Our report, "The Basic Fundamentals of Computational Complexity",
NEW:  Our report, "The Basic Fundamentals of Computational Complexity,"
line 3
OLD:  earliest convenience.  thanks.
NEW:  earliest convenience.  Thanks.

For more information about punctuation rules, type:

           punctrules

-----------------------DOUBLE WORDS-------------------------------

For file examplefile:

No double words found
```

```
-------------------------WORD CHOICE----------------------------

Sentences with possibly wordy or misused phrases are listed next,
followed by suggested revisions.

beginning line 1 examplefile
Our report, "The *(Basic Fundamentals)* of Computational
Complexity", is enclosed.

beginning line 2 examplefile
Please send any recommended changes *(at your earliest convenience)*

file examplefile:  number of lines 3, number of phrases found 2

---------------------Table of Substitutions----------------------

PHRASE                              SUBSTITUTION

at your earliest convenience:  use "soon" for "at your earliest
convenience" basic fundamentals:  use "fundamentals" for "basic
fundamentals"

------------------------SPLIT INFINITIVES-----------------------

For file examplefile:
No split infinitives found
```

Some WWB programs have been more popular than others. WWBINFO prints a list of all programs and their functions and allows users to see the scope of the series. WWBHELP responds to keyword commands and calls up programs that contain certain topics and functions. SPELL programs NOT ONLY flag mispelled words and typos according to a computerized dictionary, they will even search for words that contain a correct part: "ceed" will yield "proceed," "exceed," "succeed." There are also special programs on the split infinitive and on punctuation, one of which reminds writers that the convention to put periods and commas inside quotation marks is American, a vital point for anyone working in a discipline requiring international publication. DOUBLE lets users know when they've used the same word twice in succession, an error common to computer-edited text. WORDUSE lists commonly confused or misused words ("affect"/"effect") and phrases ("comprise," "due to") and provides paragraph explanations (about 300 items were listed at last report). Then there's DICTION, one of the most powerful in the series and the "most interesting," according to developers.

DICTION prints all sentences it "thinks" are wordy or misused and along with SUGGEST gives alternatives (at last count, over 500 "offending" words and phrases were in its file). Working on an essay written by a Professor of English, for example, DICTION flagged a number of words and phrases it didn't like: "implement," "vital," "impact," "accordingly," "in the field of," "a great deal of," "anticipate," "on the part of," "methodology" ("method," was instead SUGGESTed)--in all, 19 "questionable phrases" from 46 sentences. The point is, of course, that the program au-

tomatically (and stupidly) prints out anything in its data base: context is never a consideration. But users can create their own files, based on their own mannerisms.

WWB programs flag only "potential" problems, programmers insist, but such repeated insistence only underscores a certain (inevitable?) defensiveness about such editing programs that seem to be knee-jerk responses based on perhaps debatable criteria. Nonetheless, reports from Bell and from CSU indicate that programs such as STYLE are useful, permitting analysis that would be "otherwise impossible for the teacher" to get at in a short period of time. FINDBE, for example, turns back draft copy with all forms of the verb "to be" capitalized and underlined. It could be an extremely valuable tool for writers in the sciences who tend to overuse the passive voice and rely too much on expletives. Sample PRINTOUT Follows

--WWB PRINTOUT--

SENTENCE STRUCTURE

Passives

This text contains a much higher percentage of passive verbs (44%) than is common in good documents of this type (22%). A sentence is in the passive voice when its grammatical subject is the receiver of the action.

PASSIVE The ball was hit by the boy

When the doer of the action in a sentence is the subject, the sentence is in the active voice

ACTIVE The boy hit the ball

The passive voice is sometimes needed
1 to emphasize the object of the sentence,
2 to vary the rhythm of the text, or
3 to avoid naming an unimportant actor.

EXAMPLE The appropriations were approved

Although passive sentences are sometimes needed, psychological research has shown that they are harder to comprehend than active sentences. Because of this, you should transform as many of your passives to actives as possible. You can use the style program to find all your sentences with passive verbs in them by typing the following command when this program is finished

- style -p filename

Nominalizations

You have appropriately limited your nominalizations (nouns made from verbs, e.g., "description").

```
        Expletives

                *       *       *

programming environment

readability grades:
                        (Kincaid) 12.3 (auto) 12.8
                        (Coleman-Liau) 11.8 (Flesch) 13.5 (46.3)

sentence info:
                        no. sent 335 no. wds 7419
                        av sent len 22.1 av word leng 4.91
                        no. questions 9 no. imperatives 0
                        no. nonfunc wds 4362 58.8% av len 6.38
                        short sent (<17) 35% (118) long sent (>32) 16% (55)
                        longest sent 82 wds at sent 174;
                        shortest sent 1 wds at sent 117

sentence types:
                        simple 34% (114) complex 32% (108)
                        compound 12% (41) compound-complex 21% (72)

work usage:
                        verb types as % of total verbs
                        tobe 45% (373) aux 16% (133) inf 14% (114)
                        passives as % of non-inf verbs 20% (144)
                        types as % of total
                        prep 10.8% (804) conj 3.5% (262) adv 4.8% (354)
                        noun 26.7% (1983) adj 18.7% (1388) pron 5.3% (393)
                        nominalizations 2% (155)

sentence beginnings:
                        subject opener: noun (63) pron (43) pos (0)
                        adj (58) art (62) tot 67%
                        prop 12% (39) adv 9% (31)
                        verb 0% (1) sub conj 6% (20) conj 1% (5)
                        expletives 4% (13)
```

PROSE covers similar grammatical ground, with particular regard to how scientific material should be presented to a general audience. There is some overlap among programs, some dependency on doing them in conjunction with one another or in sequence, but for the most part, each WWB program is self-contained and susceptible of modification. The most popular cover traditional editing and proofreading areas; the least successful attempt to deal with the essay as a whole. ORGANIZATION, for example, prints out first and last sentences of each paragraph on the assumption that topic sentences always come first and that skeleton PRINTOUT will constitute an abstract of the paper. Despite this debatable assumption, CSU faculty say, "For students learning to write short formal essays, ORGANIZATION illuminates weaknesses in organization and coherence and encourages students to revise again before handing their essays in" (will another

program flag prepositions at the end of a sentence?) ABSTRACT is on another matter entirely, but one that might also have limited value, depending on the value of the assumption inherent in the program: namely, that tolerance of abstract diction, based on "psychological research," reaches a limit at 2.3% (the standards of PROSE). The program suggests concrete alternatives. SEXIST, a variation of DICTION, though limited, seems valuable. A dictionary of 100 words and phrases that might be considered sexist, it flags any sentence that contains one of them and prints out suggested substitutions. Programmers at Bell note that old systems titles have been updated with SEXIST: "corporate spouse" for "corporate wife" and "framewriter" for "frameman."

At Colorado State University, the series would seem to have been a success. From 38 students the first year, the project grew to 140 the following term, with administrators expressing enthusiasm. After two years, the number grew to 1250. Limited equipment limits on-line time, but students put up rough drafts on the terminal at least one hour a week, and take home hard copy. CSU faculty report they like the series (71) and it is now included in freshman and advanced composition as well as in business writing. A general evaluation concluded that "textual analysis with computers intrigues college writers and speeds learning of editing skills by offering immediate, reliable, and consistent attention to surface features of their prose."

It should be pointed out, however, that CSU faculty indicate that the experiment with WWB was limited to students who could type (as it turned out, mostly females), and that, on another score, there was no marked increase in writing fluency as a result of having used the programs. CSU faculty did note that students liked using the programs and tended to do more editing on their own, without prompting from instructors. Still the question persists: who is mature enough or guided sufficiently to appreciate WWB information? On a sample student paper from CUNY's Writing Assessment Test, for example, five sentences, containing 213 words, were said to have a mean letter-per-word count of four, and a mean word-per-sentence count of 42.6, but looking at the essay, one in the "mid remedial range," one could see that the so-called five sentences were clearly the result of run ons. WWB would seem to apply to non-remedial levels only, where style is a major concern, not grammar. Nonetheless, University Associate Dean of Academic Affairs, Michael Ribaudo speculates that WWB analysis might help build a picture of characteristics common to remedial writing (numbers of passive verbs, types of sentences)-- information that might be of value in grading placement exams and in adjusting composition syllabi (36). In any case, WWB would seem to be a bit too sophisticated for general CUNY use. CUNY English teachers would be better advised to look around, first, at CUNY. Jackie Jones, for example, a modern British literature specialist who used to teach English in Education Services at Brooklyn College, uses a text editor to recognize the boundaries of a sentence and also flag subject-verb agreement. The teacher now of a three-level sequence in computer programming and data structures, she is an advocate of in-class essays done on a terminal for purposes of immediate, individual, and efficient editing (39).

It is possible that under well-organized classroom conditions, some WWB programs could be used effectively. But only, if they could be re-

written for micros not just because the present WWB operating system is restricted, but because big time-sharing systems in general, while they may be used effectively by knowledgeable people, are not the means to use to introduce computers to those in the humanities Not only are micros more suited, psychologically, to the kinds of purposes most English faculty have, but they are easier to get at and to use. So what about the University's own WYLBUR system for writing and editing? WYLBUR is a powerful system, a significant part of the University's computer operations--and deserves some mention here--but its abilities are probably far beyond the needs of most English teachers who will find in micros more suitable companions. (WLYBUR is also a remote job system, notes Rita Terdiman, University Dean for Academic Computing, which means "you can use it to send your programs to be run in batch".) (77)

WYLBUR

There is indeed a name in the computer world that is not an acronym or abbreviation: it's WYLBUR a "text editor" at the Computer Center of The City University of New York (UCC). It takes its name from one of the Wrights. (There has also been an Orvyl and a Milten).

The term "text editor," however, can cause confusion, especially for the English teacher who knows little about computers and expects a text editor to be software to edit copy composed on the screen. WYLBUR, is a "text editor" in the broad sense of "text" as any kind of data (numeric or alpha) and "editor" as that which allows a user to create files according to a set of commands the user gives it. The set of commands constitute what's called an "edit environment," which has an input or collect mode, that gathers the data, and a subcommand mode which issues the orders for the editing. Many English teachers at CUNY have been using WYLBUR for a long time. B. J. Rahn (English, Hunter) for example, began using WYLBUR in 1978 for an extensive bibliographic project: "It's a powerful system." WYLBUR is a Time-Sharing system, meaning that several people can be ON-LINE at one time (you need permission, then a password) creating the illusion for each user that the CPU is responding to all simultaneously (whereas it is really allotting individual time in a complicated way, faster and more "illusory" depending on the power of the system.)

The word "system" is significant. WYLBUR can do word processing, but it is not a word processor. It is a powerful interactive device (it runs under MVS: Multiple Virtual System) that prepares programs and data for additional processing on the computer. Word processing is an "applications" use of the computer; text editing, the preparation, so to speak, for applications.

Mike Southwell (York) has experimented with WYLBUR in a class on Business English, doing word processing, an activity that would be better served on micros (if they had been available). Students had difficulty logging on, getting going, he notes, a complaint faculty themselves often make when first learning to use the system. In addition, says B. J. Rahn, the manual is not well-written and she needed help from UCC staff to explain certain inconsistencies or omissions (such as how to handle the control devices for double or triple spacing or how to do underscoring). As Ben Klein, Head of User Services at UCC concedes: "a certain amount of

hand-holding is necessary." The University does offer help in the form of short-term seminars, courses called "Introduction to WYLBUR" and "Introduction to VM" (VM: Virtual Machine is a control program for another operating system that runs editing programs like XEDIT), but these are not courses in the standard sense of the word. The documantation for WYLBUR is "very thick" and those who want to get started, says Rita Terdiman, should expect to spend about 30-40 hours, manual in hand, at the terminal.(77) There are also self-teaching lessons, like NEWTEACH. Carolyn Kirkpatrick (English, York) has suggested that UCC staff run special seminars just for humanities teachers that would explain all the resources of the system including course authoring.

To the extent that English teachers work with large quantities of information and want to experiment in analyzing data and in preparing documentation, WYLBUR (and VM) are powerful and valuable resources and could be considered remote aids to instruction.

VI. Computers and Writing Poetry

Archibald MacLeish's famous line--"A poem should not mean but be"--may be put to the ultimate test by computer programs designed to create poetry. Many such programs say they're teaching "language awareness," meaning that they're sugar-coated pills to teach the basics. The more audacious claim to be stimulating an interest in words and even studying mind as a creative process. The less timid offer their wares without apology. Peter McWilliams (47), for example, who describes himself as an "inveterate word processor poet," admits that the idea of a poet using a computer to create poetry "would probably strike most people as highly incongruous," but he says he's done it, and that "it's happening daily at great universities in ComputerLand stores, and in stereotypical poets' hovels all over the country." In truth, some software seems harmless enough, perhaps even helpful: programs that provide definitions and rhymes, a kind of thesaurus up on a screen. But questions arise--or should arise: "Writing poetry with a computer is like eating spaghetti with a fork a yard long. It can be done, but it's not easy." (46) So why do it?

Most authors avoid the question with humorous remarks or by presenting their programs playfully--defensively it would seem--as "games." Educational benefit is rarely emphasized. Rather, it is as motivation that such programs are sold, as imaginative ways to encourage thinking about style and form, and about the nature and function of language.

McWilliams, for example, reshuffles words, lines, and "whole chunks of material" to update well-known poetry and to rewrite: Miss Moffet is no longer sitting on a tuffet eating curds and whey, but is Ms. Carpool, sitting on a barstool; she's "modern," no longer "little," so that alliteration may be preserved, and she's eating her "Yogurt Yoplait." By changing 11 words of the "poem's" original 26, McWilliams says he has succeeded in parodying "what goes on in the creative mind as it coaxes and hones the English language into poetry," and that he has demonstrated that quick, silent, and effortless revision can free the creative writer from mundane tasks so that inspiration "may flow unfettered." It's hard to quarrel with conviction when it's expressed in such whimsical prose (McWilliams is a charming writer) and when the so-called target audience is never identified.

Not that such identification makes a poetry program valuable. Stephen Marcus says that his COMPUPOEM addresses a wide audience, grades 4 to 12, children and adults, but although his "game" is general enough for anyone to play, the language of the text at times suggests limitations (see Program numbers 780ff of the print-out), and the "instructional value" seems definitely restricted to those in lower grades who may not notice the program's shortcomings. Marcus, an Assistant Director of the Southeast Writing Project in California,(49) has a good idea and one that is attracting a growing number of English teachers. What is doubtful is whether this particular program is a good way to get students to learn about the parts of speech and something about the nature of poetry, poems, and the "creative process." Marcus also claims to generate concern for planning ahead, unity, coherence, structure, revision, and authorship.

Sample PRINTOUT from Stephen Marcus' Program, COMPUPOEM

University of California 1981

(early version)

```
1  HOME:: PRINT "     *****  COMPUPOEM  *****": PRINT : PRINT
2  PRINT "BY STEPHEN MARCUS, PH.D.": PRINT
3  PRINT "ASSISTANT DIRECTOR"
4  PRINT "SOUTH COAST WRITING PROJECT"
5  PRINT "UNIVERSITY OF CALIFORNIA
6  PRINT "SANTA BARBARA, CALIFORNIA 93106"
7  PRINT "(805) 961-442/3218"
8  FOR J = 1 TO 5000: NEXT J
9  HOME : PRINT : PRINT : PRINT
10  PRINT "THIS GAME CAN HELP YOU"
11  PRINT "BECOME A POET.": PRINT
12  PRINT "YOU WIN THE GAME IF YOU WRITE"
13  PRINT "SOMETHING YOU LIKE OR IF YOU HAVE"
14  PRINT "AN INTERESTING TIME.": PRINT
20  PRINT "PLEASE TYPE IN THE FOLLOWING"
21  PRINT "KINDS OF WORDS OR PHRASES
30  PRINT "AS YOU ARE ASKED FOR"
31  PRINT "THEM:": PRINT
40  PRINT : PRINT "A NOUN";: INPUT N$: PRINT
50  PRINT "AN ADJECTIVE DESCRIBING THE NOUN";: INPUT A$: PRINT
60  PRINT "ANOTHER ADJECTIVE";: INPUT B$: PRINT
70  PRINT "A PREPOSITIONAL PHRASE"
75  PRINT "TELLING WHERE OR WHEN"
76  PRINT "SOMETHING CAN HAPPEN TO"
77  PRINT "YOUR NOUN"; INPUT P$: PRINT
80  PRINT "A VERB";: INPUT V$: PRINT
90  PRINT "AN ADVERB DESCRIBING"
91  PRINT "HOW YOUR NOUN DOES IT";: INPUT C$: PRINT
95  PRINT "ANOTHER ADVERB";: INPUT D$: PRINT
100  HOME : PRINT "HERE IS THE POEM:": PRINT : PRINT : PRINT : PRINT
110  PRINT "THE";N$
120  PRINT "     ";A$;", ";B$
130  PRINT P$
140  PRINT "     ";C$", ";D$
150  PRINT V$;".": PRINT : PRINT : PRINT : PRINT : PRINT : PRINT
157  PRINT "SATISFIED WITH YOUR POEM";: INPUT O$
160  IF O$ = "YES" THEN 170
161  IF O$ = "NO" THEN 162
162  PRINT : PRINT : PRINT : "EVEN IF YOU DON'T LIKE YOUR POEM,"
164  PRINT "GIVE AT LEAST A MOMENT'S THOUGHT TO"
166  PRINT "WRITING IT DOWN.  DO THIS BEFORE"
168  PRINT "DECIDING IF YOU WANT ADVICE....": PRINT " PRINT : GOTO 270
170  PRINT : PRINT "NOW IS A GOOD TIME TO STOP"
172  PRINT "AND WRITE YOUR POEM DOWN ON A PIECE"
174  PRINT "OF PAPER BEFORE YOU GO ANY FURTHER"
176  PRINT "IN THE GAME.  DO THIS BEFORE YOU"
178  PRINT "DECIDE IF YOU WANT SOME ADVICE....": PRINT : PRINT : GOTO 270
270  PRINT : PRINT "WANT SOME ADVICE (YES OR NO)";: INPUT R$
275  IF R$ = "NO" THEN 450
290  IF R$ = "YES" THEN 285
285  HOME : PRINT "PICK A NUMBER BETWEEN 1 AND 9."
286  PRINT : PRINT "   1. PHRASES"
287  PRINT "   2. NOUNS"
718  NEXT X
720  Z = INT (10 *  RND (1)) + 1
722  IF Z > 5 GOTO 706
724  INVERSE
726  NEXT J
728  NORMAL
730  PRINT "TIME TO GET BACK TO WORK...."
732  PRINT "WANT TO WRITE ANOTHER POEM (YES OR NO)";: INPUT A$
734  IF A$ = "YES" GOTO 738
736  IF A$ = "NO" GOTO 740
738  TEXT : HOME : GOTO 40
740  TEXT : HOME : GOTO 12080
750  HOME : PRINT "     YOU MIGHT WANT TO WRITE A"
752  PRINT "POEM WHICH IS IN SOME WAY INSPIRED"
754  PRINT "BY SOME FAVORITE WORD, PHRASE OR"
756  PRINT "IDEA BORROWED FROM SOME OTHER WRITER."
758  PRINT : PRINT "     DON'T BE OVERLY CONCERNED AT THIS"
760  PRINT "STAGE OF THE GAME ABOUT PRACTICING"
762  PRINT "COMPUPOEM USING SOMEONE ELSE'S WORDS."
764  PRINT "(IF YOU ARE A TRIFLE UNEASY, HOW ABOUT"
766  PRINT "STARTING YOUR NEXT POEM WITH THE"
768  PRINT "NOUN 'THIEF'?)"
770  PRINT : PRINT "WOULD YOU LIKE SOME EXAMPLES OF"
772  PRINT "BORROWED PHRASES...YES OR NO";: INPUT A$
774  IF A$ = "NO" GOTO 450
776  IF A$ = "YES" GOTO 778
778  HOME : PRINT "SOME EXAMPLES:": PRINT
780  PRINT "   * THE FASCINATION OF THE ABOMINATION"
782  PRINT "   * A WINE REVOLUTION"
784  PRINT "   *NAMELESS, UNREMEMBERED ACTS"
786  PRINT "   *ILL-TIMED COUGHS"
788  PRINT "   *IMPERISHABLE BLISS"
790  PRINT "   *RAGGED CLAWS"
792  PRINT "   *RANK, UNWEEDED GARDEN"
794  PRINT "   *EYELESS AT GAZA"
796  PRINT "   *AT THE MILL WITH SLAVES"
798  GOTO 448
800  HOME : PRINT "THE PERSON WHO CONSTRUCTED THIS GAME"
802  PRINT "WAS ONCE TOLD THAT HE HAD 'WASTED A"
804  PRINT "PREPOSITIONAL PHRASE.' WELL...HOW WAS"
806  PRINT "HE TO KNOW THAT THEY WERE SO VALUABLE?!!": PRINT
808  PRINT "     EVEN THOUGH THE NOUN YOU PICK"
810  PRINT "IS AT THE 'CENTER' OF THE POEM"
812  PRINT "PROVIDES THE 'FOREGROUND,' SO TO SPEAK,"
814  PRINT "IT'S THE PREOSITIONAL PHRASE WHICH"
816  PRINT "PROVIDES THE POEM'S BACKGROUND.  IT"
818  PRINT "LOCATES THE POEM, OR GIVES IT DIREC-"
820  PRINT "TION.  BEFORE YOU CHOOSE YOUR NOUN, YOU"
822  PRINT "MIGHT WANT TO THINK OF AN IMPORTANT"
824  PRINT "PREPOSITIONAL PHRASE WHICH 'ANCHORS'"
826  PRINT "YOUR NOUN (WHATEVER IT TURNS OUT TO"
828  PRINT "BE) IN SOME IMPORTANT WAY."
830  PRINT "WAY."
832  PRINT : PRINT "WANT SOME EXAMPLES...YES OR NO";: INPUT A$
834  IF A$ = "NO" GOTO 450
835  IF A$ = "YES" GOTO 836
```

BEST COPY AVAILABLE

On a sample series of runs, however, a couple of cynical English teachers noted, among other problems: (1) the program's tolerance for spelling errors; (2) confusion of parts of speech--a prepositional phrase was given as something "that puts the noun someplace" so one wag typed in "raspberry"; it was accepted--; (3) awkward phrasing--"What's a verb that describes what your noun might do there, or how it might be?"; (4) intransigence--transitive verbs were not provided for and adverbs always had to be placed in front of verbs; and (5) self-conscious (forced USER FRIENDLY) attempts at encouragement.

Of course, it's easy to criticize. What Marcus is doing (and still modifying) by extending the idea of CAI as poetry is significant, and it is no small point to note that if the "game" does attract students who might otherwise not play by the traditional rules, then an important part of education has begun. Still, there is enough technical expertise to expect better. Kathleen Jaycox says better can be done, though to do so requires "very complex" programming. In a program designed to encourage students to deal with figurative language, is the student confusing metaphor and simile? Can the student recognize a metaphor, but not produce one? (37)

Poetry programs can, however, be used to advantage. Kevin McKean, in an article in Byte--"Computers, Fiction, and Poetry"-- describes how Louis Milic accidentally scrambled words in a poetic line and "discovered" random-generated poetry (or nonsense) which many people think is the gist of modern verse--thus provoking the question: is such modern poetry nonsense? Examples: #1: What does she put four whistles beside heated rugs for? #2: Because the pleasure-bird whistles after the hot wires, Shall the blind horse sing sweeter?(46) Teachers may recognize which one is Dylan Thomas', which one the computer's but will students? This intriguing question might be used effectively not just at the level of freshman composition, where introductions to the genre are often taught, but in advanced courses in creative writing. Indeed, it's not clear to many English teachers what the differences are (or are supposed to be) between the examples.

Helen Schwartz is optimistic about poetry-generating programs that "let students explore what is and what is not poetry" by making them aware of word choice.(67) Others, the majority of English teachers, tend to be critical and to see only gimmicks in such discs. Clearly, the more creative among the poetry programs allow for options through "open-endedness" and suggest that students do revision. It seems doubtful, however, that the memory power that the best programs require could easily be reduced to micros, or that English teachers without extensive experience in programming could write them. Besides, given the nature of what creative writers themselves know about creativity, it is doubtful that any program could anticipate the electric circuitry of the human brain (AI researchers at MIT notwithstanding). So it would seem that the state-of-the-craft in poetry programs would be simple lessons that advertise themselves only as "nice tools for playing with words," the way Marcus begins his description. That such programs will inspire a non-poet to experiment and perhaps eventually try the real thing, as authors Dwyer and Critchfield (25) illustrate in their book on BASIC, are goals that any English teacher would endorse though no one has yet managed to define "the real thing."

PRINTOUT from Dwyer and Critchfield:

```
10 PRINT "This program can help you become a "poet"."
20 PRINT "Please type in the following kinds of words
         or phrases"
30 PRINT As the program asks for them:'
40 PRINT "noun--";: input n$
50 PRINT "Adjectives describing the noun--;: input a$
60 PRINT "Another adjective--";: input b$

70 PRINT "a prepositional phrase telling"
75 PRINT "Where or when something can happen to your noun--";:
         input p$
80 PRINT "A VERB__";: input v$
90 PRINT "an adverb describing how your noun does it--";:
         input c$
95 PRINT "another adverb--";: input d$
100 PRINT: PRINT" Here is the "poem": ":PRINT
110 PRINT "the"; N$
120 PRINT "; A$; ","; B$
130 PRINT P$
140 PRINT ""; C$;', "; D$
150 PRINT V$;"."
160 PRINT "want to make another "poem"";: input Z$
170 if Z$ = "yes" then 40
180 end

Ready,

RUN


THIS PROGRAM CAN HELP YOU BECOME A "POET".
PLEASE TYPE IN THE FOLLOWING KINDS OF WORDS OR PHRASES
AS THE PROGRAM ASKS FOR THEM:

noun--? snow
adjectives describing the noun--? gray
another adjective--? ragged
a prepositional phrase telling
where or when something can happen to your noun--? between
the buildings
a verb--? falls
an adverb describing how your noun does it--? slowly
another adverb--? uncertainly

Here is the "poem":

the snow
   gray, ragged
between the buildings
   slowly, uncertainly
falls.
```

```
The same form, using different words, generates a
different poem.

RUN

THIS PROGRAM CAN HELP YOU BECOME A "POET".
PLEASE TYPE IN THE FOLLOWING KINDS OF WORDS OR PHRASES
AS THE PROGRAM ASKS FOR THEM:

noun--? professor
adjective describing the noun--? tired
another adjective--? harassed
a prepositional phrase telling
where or when something can happen to your noun--? in the office
a verb--? mumbles
an adverb describing how your noun does it--? incoherently
another adverb--? softly


HERE IS THE "POEM":

THE PROFESSOR
   TIRED, HARASSED
IN THE OFFICE
   INCOHERENTLY, SOFTLY
MUMBLES.

WANT TO MAKE ANOTHER "POEM"? NO (One wonders how soon this
is answered.)
```

Poetry programs like this can be made to require concrete or abstract words, connotative or denotative phrasing, general or specific reference; they can even be color-coded according to different grammatical patterns.(70) In short, writing poetry on computers is not a bad way to motivate some kinds of students; to organize small groups to work on composing, editing, and evaluation, or even to attract fearful teachers to The Machine. And it is just one part of a growing interest in using computers to go beyond the basics. There are also "literature" programs that purport to sharpen awareness about the nature of fiction and the elements of narrative--programs with names like TAILSPIN (Jim Meehan, University of California, Irvine), and OPERA (Sheldon Klein, University of Wisconsin) which simulate "story-generating methods" on the analogy of problem-solving strategies in the sciences. As McKean has shown, the field is rife with experimentation.

VII. Computers and Research Related to Literature

In addition to word-processing as a means of getting English teachers involved with computers, the use of "new technology" to gather literary data and do word searches is likely to appeal to the most recalcitrant of faculty. In fact, the use of computers to establish concordances and indexes, and to study literary style--patterns and frequency of key words and phrases--can hardly be called "new." Joseph Raben (Queens College), for example, has been interested in such applications for twenty years. In 1966 he founded the journal, Computers and the Humanities, and since January, 1983, he has been publishing a newsletter on this topic called SCOPE (Scholarly Communication: Online Publishing and Education).(63) A related activity is the international conference which was held for the sixth time in June 1983. There is also an Association for Computers and the Humanities, headquartered at The University of Minnesota, and an association for Literary and Linguistic Computing, headquartered at Cambridge University.

The Journal, part of the Association on Computers and the Humanities, is more theoretical than it used to be, Raben notes. There is increasing attention to the "theoretical concepts underlying computer science, artificial intelligence, techniques to retrieve textual information, and higher-level applications such as metrical patterns in poetry." The Journal also publishes technical articles, book reviews on the wide range of print publications appearing regularly, and abstracts of relevant articles in other periodicals.

Although not strictly CAI, the use of computers to help compile bibliographies and concordances may be said to be a part of instruction since many English teachers supervise seminars and independent study projects that could benefit from such computer use. The computer concordance to the Revised Standard Version of the Bible, for example, took only a few months to compile, while it took ten years and 54 19th century scholars to do the concordance for the authorized version. (78)

For some odd reason medievalists seem attracted to computer research (it was only a few years ago that an executive with Maidenform confessed he had a Ph.D. in medieval studies). At Virginia Polytechnic Institute and State University, two scholars are said to be nearing completion on a computerized bibliography of more than 10,500 citations of Chaucerian studies published since 1900, and Rudy Spraycar, whose MLA paper is entitled, "Computers, Statistics, and Stylistics: The Case of the Oral Formula," began using computers in 1972 to examine epic literary style in medieval texts.(74)

At Baruch, Jerry Dalgish takes a different research tack, one with more obvious direct benefits for the classroom.(23) He is working on computerizing error analysis at the level of the sentence by gathering collections of specific errors according to foreign language. He envisions a Guide to Errors in Syntax that would be made available to teachers for research, and that then would be used by teachers to generate lessons on errors and idioms tailored to different cultures and languages.

Editing projects related to research are also being pursued. The Dickens Studies Annual, for example, a bound volume of essays published by AMS Press, would be greatly aided by word processing, as would the collected edition of Thomas Carlyle that Fred Kaplan (Queens College) and others have been working on, under an NEH grant.(40) Familiar with word processors for writing and editing and with "on line" California libraries ("there must be no card catalogs left in the state"), Kaplan emphasizes the advantages to the scholar who is thus freed from typing costs and dependence on secretaries.(28)

Bibliographies, concordances, attribution scholarship, word processing to put up new manuscripts--efficiency, it would seem, without threat to the discipline. But what about computers for stylistic analysis?--the use of quantitative methodologies borrowed from the sciences where, as Spraycar says, the "tests of statistical validity require a random standard as background, against which the 'significance' of data becomes apparent by virtue of its difference from the random pattern."

Mary Hiatt (Baruch) who uses computers for dealing with large quantities of text, points out that "...with computer-based research, there is often an automatic assumption of objectivity, whether or not bias does exist." In other words, even in so-called neutral fields, statistical validity, as Spraycar might say, follows from the design of the question. A program could be planned that would elicit only selective data--which would not be the "fault" of the computer, but rather of the programmer. Nonetheless, the advantages of using the computer to analyze text, Hiatt suggests, should be obvious; a careful researcher, no matter what his tools, should always be on guard. In looking for an "incidence of parallelism" and "co-occurring rhetorical devices of repetition" in contemporary American prose, Hiatt picked up 108 kinds of parallels from a 250,000 word sample, "far more, and far more accurately, than any human reader could have found or ever would have predicted."(33) (Hiatt did her own programming.) In a second study, concerning the style of contemporary male and female writers, she analyzed 200,000 words and flagged adverbs, adjectives, similes, sentences and so on, concluding finally, from an overwhelming sampling of randomly-selected passages, that changes of stereotypes of style had no basis in fact. The information was, of course, gleaned from the form of words, not from their meaning, and it was information that perforce ignored subtleties of style. But the data did show that a machine is only a reflection of its programmer: the adverb was identified; what it "meant" was up to the researcher to say.

VIII. Conclusion: What Should English Departments Do?

Time Magazine's Man of the Year issue may do it: 1982, it declared, for the first time declining to designate a person for its annual notice, was the Year of the Computer--meaning, the personal computer.(78) And meaning, especially, that its potential influence can no longer be ignored. A Yankelovitch poll recently reported that 57% of the American people think that personal computers will enable children to read and do arithmetic better; the increasing number of grant proposals requesting Micros for CAI suggests that the percentage may be higher in education. What Time Magazine may have done, however, is to increase not only awareness of the personal computer, but to up the anxiety rate: If Minnesota schools lead the country, with one PC for every 50 students and the largest collection of locally-programmed software, with CAI programs that promise to reduce remediation as well as improve scores on standardized exams, can any school, at any level, afford not to compete? The political and sociological ramifications of unequal opportunity are enormous. But anxiety clouds judgment, accounts for hardware coming in before adequate software has been developed, and is responsible for the confusion that besets English teachers who don't know where to turn for fast, jargon-free, reliable information. Everyone has a list of software companies that put out English programs, but no one has an organized collection of good materials, arranged for easy consultation according to topic or grade.

Teachers need to resist what they don't yet know about and to resist even more strongly if they know something to be useless. And English teachers need to make informed judgments about English software. Where CAI will be used effectively will probably be at those institutions that are arranging workshop seminars for English faculty to be introduced to the promises and problems of the "new technology;" at those colleges that are instituting liberal arts courses in "computer literacy" that involve more than talking about computers; in departments of English where reviews of software are discussed or published; and at those universities that encourage faculty retraining programs and sponsor special summer or weekend "computer institutes" for humanities teachers.

At City College, for example, Norman Levine, who represents the humanities division on a college-wide computer-literacy committee, has helped design a freshman course, Understanding Computers, part of a core requirement for all students in the liberal arts and social sciences.(43) The course, which consists of two lecture hours and two hours of lab and recitation, is "designed to acquaint the non-technical student with computers and how they work, their uses, and the impact they are having on society." Going further than many so-called computer-literacy courses which turn out to be mostly talk about "societal issues," the City College requirement includes "hands-on" experience, with students writing simple programs (BASIC on micros) and spending at least two weeks on applications related to the major. Students also have an opportunity to analyze "computers in education," including CAI.

At Hunter, B.J. Rahn is similarly busy with a Masters level concentration of 9-12 credits, linking computer science with English that will fit into the Masters' programs in either discipline.(64) "The computer science department is going to be the largest division in the school," she

notes, so "why not attract them to English?" The program, offers a package of courses of "graduated complexity" including textual editing (word processing), textual analysis, using PL 1, the establishment of a bibliographical data base, and work on problems in computational linguistics (under the guidance of Harvey Minkoff in the English department). "With a minimum of training," Rahn points out, "members of the English Department could teach the course in textual editing."

The effects of such "interfacing" between English and Computer Science (or data processing) can be not only to enlarge the pool of students taking electives in English, but to encourage more English faculty to learn about computers and new directions in CAI, some, such as simulation, of major interest for problem-solving. There is also certain to be development of the kinds of rhetoric or dialogue programs started by Hugh Burns and Helen Schwartz--CAI that will likely prove attractive to traditional English faculty especially as the burden of remediation is reduced.

And as more English teachers become authors, it should be they who write the guidelines for good programming, since it is they who are most aware that a common mistake in designing software is trying to "replicate the sensitivity of a teacher-student dialogue."(67) Helen Schwartz' suggestions along with Paul Heckel's "Advice to intelligence designers" in Infoworld (31) should be read by all would-be programmers. Heckel's epigram, from Pascal, is worth remembering: "Anything that is written to please the author is worthless." It is difficult to believe that shoddy software ever undergoes peer review or extensive revision. Heckel says he always expects his own work will have bugs in design or flaws in logic, but that only by getting users' reactions will he ever discover them, fix them up and thus improve his craft. What many programmers do, he says, is get rapport, but only with themselves.

They also fail to ask colleagues to share in evaluation and instead offer testimony that CAI works based only on student questionnaires about attitude and small statistical samplings that indicate that CAI classes may do as well as traditionally-taught ones, or slightly better. Enthusiasts sometimes tend to confuse good intentions and even good program design with good instruction. Schwartz' admonition is worth quoting though it would seem to be obvious: Computer programs must be developed and tested by "human mentors experienced in teaching and knowledgeable about the unique qualities and procedures of their (academic) discipline."

Individually, in groups, as a department, at national conferences, in significant publications, English teachers need to exercise their traditional vigilence over any innovation, no matter how alien it may seem. Milton--the other one, not WYLBUR's brother (p. 87)--asked that we not praise fugitive and cloistered virtue that never sallies out to meet the adversary. English will be contaminated by CAI only if English teachers allow the new technology--video, cable, computers--to develop without them. As for what English teachers owe each other--Milton again: "For he who freely magnifies what hat been nobly done, and fears not to declare as freely what might be done better, gives ye the best cov'nant of his fidelity;...." Sometime soon, no doubt, some one will boot this one up, too, for a WWB PRINTOUT.

IX. Computerese for English Teachers

BASIC

The most popular and widely-used of the programming languages on micros (personal computers). An acronym for Beginner's All-Purpose Symbolic Instruction Code. Designed at Dartmouth in 1963. Like any language, it has dialect variations, but these should not concern you.

BIT

Short for Binary Digit, which can have only two possible values--zero or one. It is the smallest unit of data recognized by the computer. All data (letters, numerals, symbols) handled by a computer are "digitized"-- expressed entirely as a combination of BITS. Eight BITS = a BYTE and 4 BITS = a NIBBLE. Computerese, also known as Computerspeak, or technobabble, suffers from such cuteness. Defenders say they're being USER FRIENDLY.

BOOTING (UP)

Getting started--turning on the machine and inserting a start-up disc. Takes its name from the expression, tugging at one's bootstraps. One BOOTS UP usually by loading in a disc that clears away old stuff and gets ready for new stuff.

BUG

A problem or mistake in either the hardware of software. Takes its name, they say, from the time an actual bug was discovered in a machine, causing the system to stop functioning. If a BUG occurs in hardware, there's probably something wrong with the electrical system, or maybe in the actual design of the main unit or in the accompanying hardware. Most times, however, BUGS are in the software--errors in the logic of the program. Then you have to DEBUG the program to find the errors. You can go buggy trying. BUGS should not be confused with "Error Messages," which a screen will display if you've tried to type something that goes against the rules of either the machine or the language. BUGS aren't identified, and many times programs run with information that is incorrect.

BYTE

A group of eight BITS. The usual home computer or micro contains BYTES by the thousand, as in KILOBYTE.

CHIP

Piece of semiconductor material containing microscopic integrated circuits also known as an IC, for "integrated circuit." The part that contains all the coded information. Take a look at your fingernail: that's the size of a chip, but probably by the time you read this, the size has shrunk even further. Takes its name from silicon (chips). The CHIP helps control the computer's functions and, incidentally, makes very attractive jewelry.

CPU

Abbreviation for Central Processing Unit within the machine or hardware. This is the heart, guts, brain of the computer, whichever body reference you prefer. On micros, it is itself a single integrated chip of silicon. Other CHIPS constitute the memory, Input/Output, etc. The CPU controls peripherals + memory.

CRT

Abbreviation for Cathode Ray Tube, which for all practical purposes can be called simply the T.V. monitor or screen. It's an OUTPUT device, as in INPUT/OUTPUT, or I/O. Sometimes people forget that the screen OUTPUTS, and think that OUTPUT refers only to the printer. (The CRT also inputs.) Use the two-tone green letters on black for word processing.

CURSOR

The blinking square or rectangle that appears on the screen and tells you where you are or reminds you to do something. On many programs, the CURSOR will not move until you answer. If a CURSOR should appear and does not, the machine may be in trouble.

DISC DRIVE

The small rectangular container into which DISCS are put. A dual disc drive has a place for a master disc, say a word-processing program, and for a blank disc for you to store your files. The DISC DRIVE, that which drives the discs, or reads them, is part of the PERIPHERAL hardware you buy when you buy a computer.

DOCUMENTATION

A fancy word for either the instructional manual that comes with your computer or for the kind of instruction you provide for a reader when you write your own program. If the latter, you want to write a DOCUMENTED program that anyone can come along and use it or modify it with ease and not find symbols and shorthand unidentified. Attention English teachers looking for extra employment: most manuals are terribly written. ("It's too late--No one can help"--J. Brandler, Computer Science, York College.) But see what Carnegie-Mellon is doing about making such such instruction clear. (12)

DOS

Abbreviation for Disc Operating System. Different operating systems are not, alas, interchangeable, so if you see a program you like, check its DOS and see if what you have in hardware will accept it.

DOT MATRIX

Another term that should not concern you except that you might be interested in having a printer and want to know that you have a choice, depending on looks, print time, and money. Most printers are the DOT MATRIX kind; another kind, neater looking, perhaps, slower and more expensive, is DAISY WHEEL. DOT MATRIX prints the way planes do sky-writing, forms characters from a two dimensional array of dots.

DOWN, or DOWNTIME

A feared condition. Means the computer is not working because of failure somewhere. The system is then DOWN for hours or even for days. All of which means that the machine is secondary to the teacher who should always be Up.

FILE

A collection of logically related records or data treated as a single item. The name and contents of data you store on your disc. Micros with different memory capacities will store different amounts. Naming a FILE properly is important when you have many FILES on one disc. Don't get cute or private. It's possible, by the way, to SAVE files in such a way that you LOCK them away from anyone else's being able to use them.

FLOPPY DISC

Made from "flexible" material, as opposed to rigid, hard material used for HARD Discs, this floppy plastic black magnetic-coated unit looks like a 45 rmp record. It contains the programs and is inserted in the DISC DRIVE to be "read". New disc designs are hard, not floppy, and smaller (SONY has one). Handle DISCS with great care and if you have a Master Program, for a word processor, for example, you might want to cover the 1/4-inch cut-out on the floppy with a piece of masking tape so that you won't inadvertently erase the program one fuzzy night.

FLOWCHART

Still around but not really used by many programmers anymore. It's to planning a program as outlining is to writing a term paper--something more a chore, done at the end, on assignment, than as strategy at the beginning to signify logical procedures and functions. Flowchart uses arrows and different geometric patterns to indicate steps. Makes a nice poster.

GRAPHICS

Used to stand for pictures, illustrations on a screen. Good GRAPHICS means not just appropriateness of the figures on the screen but also the resolution. Some programs look awful.

HARD COPY

Simply means the printout of your stuff. To be differentiated from what the CRT displays. If you're using a word processor, your screen may not necessarily display what your printer will give you.

HARDWARE

As opposed to SOFTWARE is the machine, the silicon CHIPS, the transformer, the boards, the wire, the CPU. Also used to refer to the printer, modem, keyboard, peripherals.

INPUT

Alas, both a verb (to input) and a noun (input) or a command. As opposed to OUTPUT. Probably those who say they INPUT INPUT: also say they get back FEEDBACK. "INPUT" can be confusing as a prompt since within "the computer" data can sometimes be input or output, depending on what part of "the computer" data are sent to.

INTERACTIVE

A much-abused term in the jargon. Should mean a two way conversation feature of a program that is more than YES/NO. Some people say that they have programs that are INTERACTIVE if the program won't go on without the student giving an answer. The better the program's instruction to the student, the more meaningful the dialogue. Bad programs simply say Right or Wrong but don't tell why and don't branch for needed instruction or review. Interactive is also used to mean quick response of a system to a user usually less than a second.

INTERFACE

Can be hardware or software that links devices or systems. Also a verb--"to interface."

K, or KILOBYTE

Typical storage unit. A kilobyte comprises 1024 BYTES of memory. An 8K micro store 8,912 BYTES. 48K is enough storage for a good-sized paper (35 pp). 64K is what most micro buyers want (though the limit is going up daily 256K, 1M even, says Rita Terdiman).

KEYBOARD

Looks like a typewriter and is the part most people refer to as "the computer." Works like a typewriter except that keys are really switches which activate circuits. Keys contain special commands. You don't type at a keyboard. You KEYSTROKE.

MACHINE LANGUAGE

Like ASSEMBLER LANGUAGE, something you don't have to know about except to know that there are such things and that they are different from PROGRAMMING LANGUAGES such as BASIC, FORTRAN, PL 1, PASCAL, and so FORTH. Actually, you don't even have to know PROGAMMING languages in order to use a computer or do word processing. MACHINE LANGUAGE is the language of the machine, the zeros and the ones. Also known as low-level language since it's close to the level of the electronic components. BASIC is a high level language, closer to English. Experiments are under way on even more natural languages. One such language is called QUERY.

MAINFRAME

Short for mainframe computer. The big one, in hardware and in power. At 57th Street. As micros can deliver 250,000 instructions per second, and MINIS one million, main-frame can deliver 10 million, and more. One hooks into a mainframe (LOGS ON) via terminals. You're at your college. You phone up to LOG ON to the 57th St. computer. With a micro, you look for an outlet and plug in. You're a self-contained unit.

MENU

The offerings of a particular program--a list of options like a table of contents. You usually being here, in a program, and come back to it from time to time.

MICRO

Abbreviation for micro computer, also known as personal or home computer, though purists will say that not all microcomputers are personal computers. A micro can be simply a word processor: it won't compute.

Micros costs between $100 and $35,000, depending on hardware and screen. Most popular, all-purpose brands are IBM PC and APPLE II+. See November, 1982 issue of Money Magazine for a Special Report on micros and a brief description of 36 on the market. Also add as of early 1983 the new Apple (Lisa) and the McIntosh which will be the version for the home. Very powerful, experts say, and easy to use. Market incredibly competitive.

PERIPHERALS

Extras. The hardware accessories such as printer, monitor, disc, drives, JOYSTICKS, if you want to play video games. Beware: in prices cited for micros, peripherals are not included. You can wind up spending a fortune.

PROMPT

Symbol or words on the screen that tell you it's time to give commands--to tell the "computer" what to do. Placement of PROMPTS is extremely important in writing instructional programs.

RAM or ROM

Abbreviations for Random Access Memory and Read Only Memory. Terms that refer in the first case to memory that you can alter, erase, just read; and in the second case, to already programmed memory that's permanently in the computer. You want a micro with lots of RAM so you can get into the act.

RUN

What you type out when you want to execute a program or set of instructions. You can call up a LIST before you RUN to see how all the instructions look or how the program has been written in order to check someone else's logic or find a BUG or alter the program.

SOFTWARE

What goes into the HARDWARE. Instructions, programs

TERMINAL

A work station from which you hook up to the big computer. Enables a lot of people to use a program at the same time, or use different programs. A TERMINAL consists of a keyboard and a screen and sometimes a printer. You can phone up and SIGN ON. If lots of people are using the computer, each of them signing on and off, TIME SHARING is what it's called. The PLATO system is a time-sharing system.

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